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NEW YORK, SATURDAY, MAY 24, 1924

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Apparatus, Special, for Cleaning Producer Gas.

Apparatus, Special, for Gas Cleaning.

Apparatus, Special, for Production of Ammonium Sulphate (without Sulphuric Acid).

Apparatus, Special, for Production of Potassium Ferrocyanide.

Apparatus, Special, for Production of Sodium Ferrocyanide.

Boilers, Waste Heat.

Charging Machines.

Charging and Discharging Machines, Combined.

Condensers.

Conveyors, Hot Coke.

Discharging Machines.

Equipment, Special, for Gas and By-product Plants.

Fittings, Special.

Holders, Gas.

Plants, Blue Water Gas.

Plants, Carburetted Water Gas.

Plants, Coal Gas.

Plants, Coal Gas By-products.

Plants, Coke Screening.

Plants, for Manufacture of Ammonium Sulphate.

Plants, for Manufacture of Concentrated Ammonia and Aqua Ammonia.

Plants, for Recovery of Benzol.

Plants, for Recovery of Cyanogen.

Plants, for Recovery of Naphthalene.

Plants, for Recovery of Tar.

Purifier Boxes.

Scrubbers.

Scrubbers, Centrifugal Vertical Type.

Tanks, Steel.

Tar Extractors.

Valves.

Fast Flexible Turbo Coupling.

B. H. Co.—De Brouwer Type Charging Machines.

De Brouwer Charging and Discharging Machines.

Feld Vertical Centrifugal Scrubbers.

Designed and Built to Suit Your Needs.

The BARTLETT HAYWARD CO.

Engineers and Founders

BALTIMORE NEW YORK

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ROOTS

An IDEAL Meter—Accurate, Reliable and Low in Cost

The Roots Positive Displacement Station Meter is merely a Roots Gas Exhauster especially designed to make it as nearly frictionless as possible and carefully tested for slip.

It operates at slight differential pressures and the accuracy is better than that of any other type of meter except the old style wet meter.

The Roots Meter is ideal because of its accuracy, small size, low initial cost, large range of capacity and pressure, reduced attendance and upkeep cost.

Write for catalog 111 and state your requirements, so that we can show you just how little it costs for perfect station meter service.

ROOTS

Rotary Foul Gas Exhausters

—

By Product Coke Plant Exhausters

—

Rotary Gas Boosters

—

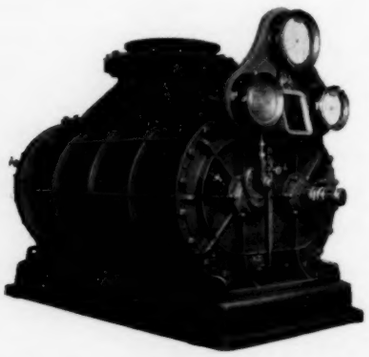
Rotary Pumps for Wash Oils, Tar and Gas Oil

—

Positive Displacement Gas Meters

—

Rotary Blowers and Gas Pumps for Industrial Gas Service



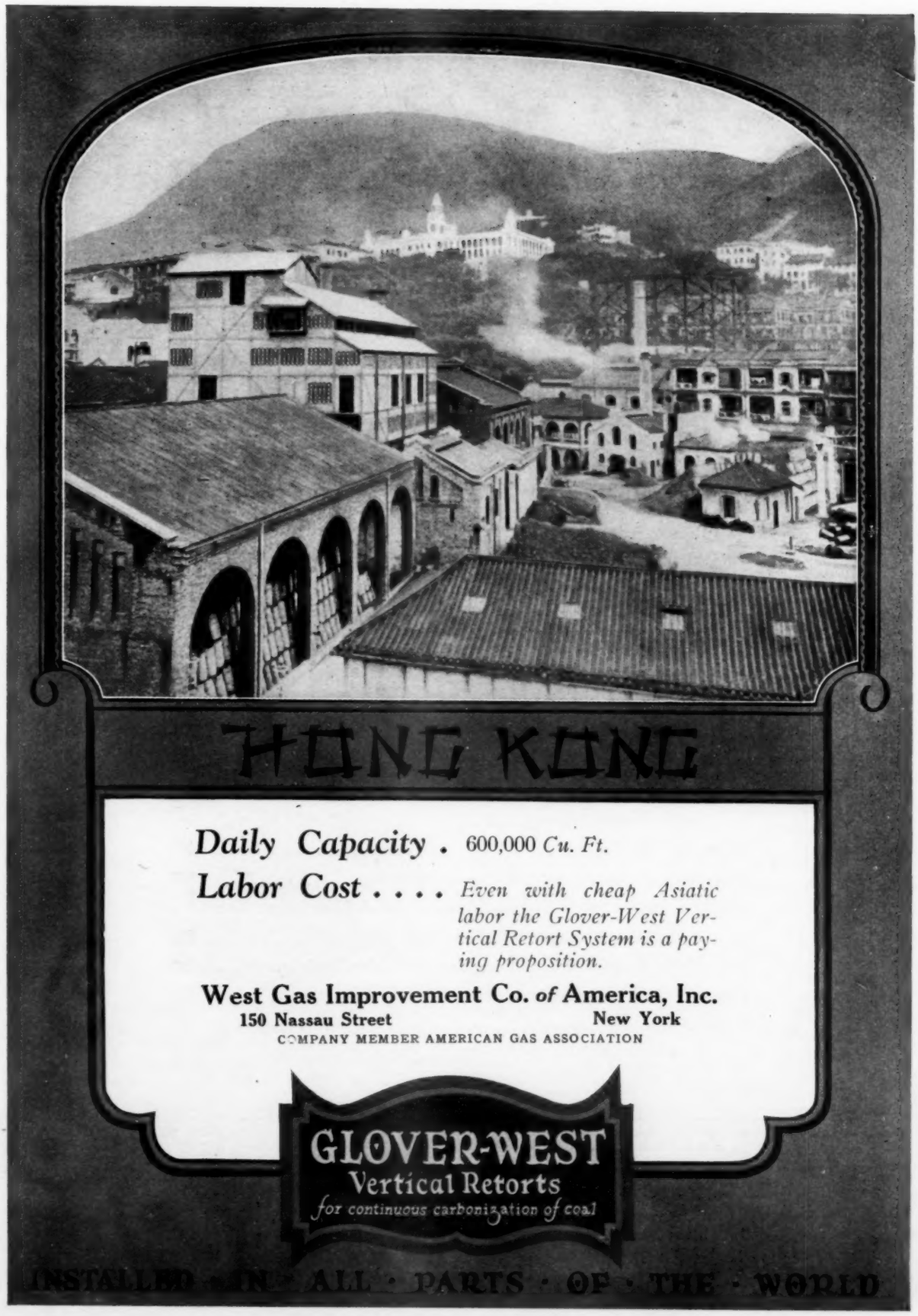
This illustration shows a Roots Positive Displacement Gas Meter equipped with convenient instrument board, which is a characteristic of the Roots Meter.

The P. H. & F. M. ROOTS CO.

CHICAGO
Peoples Gas Building

CONNERSVILLE, INDIANA

NEW YORK
120 Liberty Street


HONG KONG
Daily Capacity . 600,000 Cu. Ft.
Labor Cost . . . . Even with cheap Asiatic labor the Glover-West Vertical Retort System is a paying proposition.
West Gas Improvement Co. of America, Inc.
150 Nassau Street New York
COMPANY MEMBER AMERICAN GAS ASSOCIATION
GLOVER-WEST
Vertical Retorts
for continuous carbonization of coal
INSTALLED IN ALL PARTS OF THE WORLD

Look at the Advertisements for the Leaders in the Industry.

American Gas Journal

SIXTY-FIFTH YEAR

Published Weekly by American Gas Light Journal, Inc., 53 Park Place, New York, N. Y.

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AMERICAN
GAS JOURNAL

Vol. 120. No. 21 NEW YORK, MAY 24, 1924 Whole No. 3463

A Gas Company in Sunny Hawaii

How the Honolulu Gas Company goes after and gets business

W. B. Stoddard

THE Honolulu Gas Co., Ltd., Honolulu, T. H., is one of the most flourishing concerns of the city in the mid-Pacific. Honolulu is growing rapidly and the business of the gas company has kept pace with it. During the past year it has added 880 customers to its list, laid 41,954 feet of new mains, installed new generators and erected a new one million cubic feet gas holder, thus doubling its manufacturing capacity.

The History of the Company

Mr. F. Q. Cannon, the manager, gave some interesting facts in connection with the history of the company. It was formed in 1905 by a group of men who had secured a franchise, but had no practical knowledge of the gas industry. They secured the services of a company in California, who were to come to Honolulu, lay the main, solicit business, put the company on a paying basis, and turn it over to the stockholders. The company was one which had had excellent success on the mainland, but being unfamiliar with soil conditions here, which are very mineral, laid plain black iron pipe, and this was soon eaten through and new mains had to be laid.

For several years there were no profits but finally they secured as a manager a practical gas man, and from that time business began looking up. At first they were located in the Young Hotel building, a very exclusive place, and when they attempted to make it a combination office and factory the owners of the building objected and they were compelled to find other quarters. For a number of years they were housed on the outskirts of the business district, but a year ago the big increase in business determined them to seek better quarters, and they moved down into the heart of the city, where they have large and commodious offices, modernly equipped, and an unsurpassed display salesroom. In the office on the main floor and the mezzanine are Chinese, Japanese and Hawaiian stenographers, telephone operators and clerks, Mr. Cannon finding it very advantageous to employ the members of different races to assist in dealing with the customers, who are of many races and nationalities.

The Nature of the Customers

"The Japanese and the younger generation of Chinese are large consumers of gas," said he, "and also make good use of the different gas appliances, practically all of the newer homes being piped for gas. The Hawaiians of the better class are also good customers. Those of the poorer class use very little heat of any kind, eating raw fish and cooking their poi over a little fire in the back yard.

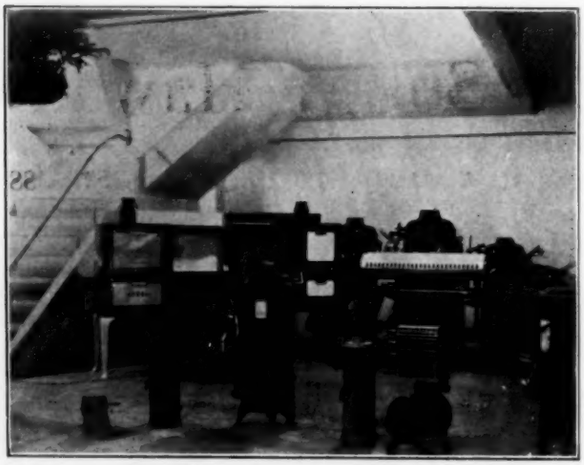
"We carry a full line of gas appliances. Unlike some, who think the place for the sale of such things is in a hardware store, I believe in stocking, displaying and boosting the sale of as many as possible of them. The climate here precludes the sale of heating stoves of any kind. In the last half dozen years we have probably sold three or four to people who wished to install them in a fireplace they had built in their home. But they are entirely superfluous and we do not carry them in stock, but make a special order for the few we sell. On the other hand, the climate is ideal for the use of gas for kitchen and laundry purposes, as it does not heat up the house like wood or coal. Many commercial firms, too, such as bakeries and chop suey houses use gas fo rcooking. We sell a great many automatic water heaters, as the bath water sometimes is a little chilly and people like to temper it. Gas toasters, irons, mangles and ranges of many types are much used.

No Extensive Mail Advertising

"We do not do much mail advertising. Occasionally little folders are sent out, same having been sup-

plied us by the manufacturers. Little items of interest and information—such as notice of change of price of gas, or a sale of some gas appliance—are generally printed on the back of our monthly statements, and cards are also frequently enclosed.

"We have not given much attention to window display as yet. Until we moved to our present location we had no adequate display windows, and not enough people passed to make it worth while to arrange a display. But in our present quarters we have an en-



tire room given over to a display of our appliances, so we have never filled up our office windows."

Broad concrete stairs lead down to a spotlessly white basement, lighted by the soft glow of many gas lamps. Palms and ferns add to the beauty of the place. Mr. Alexander, in charge of the sales force, is an expert demonstrator and a great booster for gas appliances. Against the wall are gas hot water heaters and in front of them mangles and gas irons. Several heaters, toasters, etc., are shown, and scattered all over the salesroom are gas ranges of every type, from the big range for the bakery to the little two-burner kind "just big enough for a family of two."

Newspaper Advertising

Mr. Cannon believes in advertising continuously and constructively. All of the gas company advertisements give readers something to think about. All of them are signed "The Gas Man." They make interesting reading. Here are a number of typical advertisements:

WOULD YOU LIKE YOUR SALARY CUT?
SUPPOSE the boss said he was going to
REDUCE your salary fifteen per cent.
HOW you'd howl! Or suppose the
BUTCHER, the baker, and the
CANDLESTICK maker notified you
THEY were going to raise prices on
YOU fifteen per cent. Your yells of
RAGE would sound like a session of the
BOARD of Supervisors.

YET a lot of people boost their own
GAS bills fifteen per cent and think
NOTHING of it.
I'VE already told you about it a good many
TIMES already. You know that if you
PAY your gas bill by the 15th, you get
APPROXIMATELY fifteen per cent off.
NOW I'm telling you again. Next
TUESDAY is the 15th. Why not save
THAT fifteen per cent, instead of giving
IT to the Gas Company. Maybe you
CAN use it some time.

THE GAS MAN.

Then, on the 16th, they launched the broadside:

DID YOU PAY—OR ARE YOU SORRY?

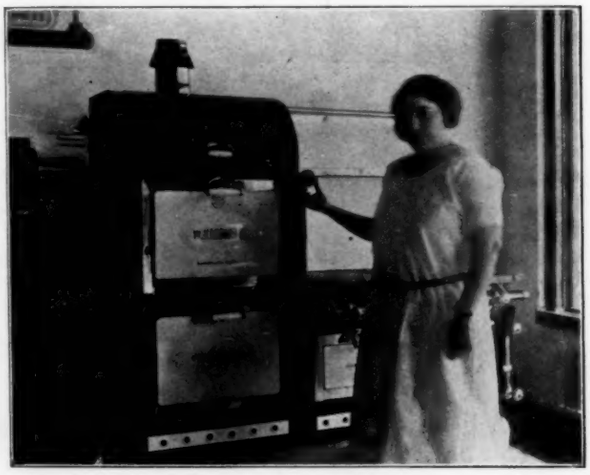
Well, folks, yesterday was discount day at the Gas Office. It was the last day you could pay your monthly Gas Bill and get the benefit of the liberal discount allowed on all bills paid by the 15th of the month. Did you get the discount, or did you forget?

Waste of Gas Cautioned Against

An ad that they used to caution people against the waste of gas read:

DON'T SET FIRE TO YOUR MONEY

Do you know what a "spill" is. The chances are you don't. They aren't used much these days. But in former years, when matches we're scarce and expensive, people used to roll a strip of paper into a slender tube, ignite it by holding it in the



fire and use the blazing taper to light the lamp or pipe, or start another fire. This slender tube was called a "spill."

You could use a five dollar bill to make a spill if you wanted to, and could use it to light your gas stove. But you wouldn't. That would be burning up money needlessly.

When you are careless with your gas stove, and let it burn up too much gas, that, too, is burning up money. We don't want you to do that. We want you to use your gas service as efficiently as we are furnishing it. If you do

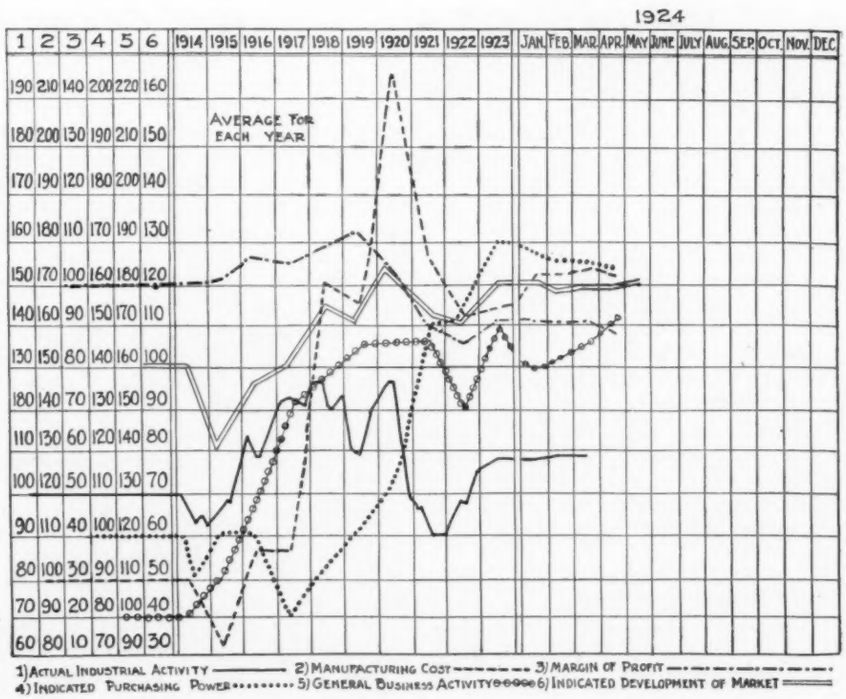
(Continued on page 493)

Business Outlook Optimistic

Market not losing ground—Policy of "watchful waiting" may soon come to an end

L. W. Alwyn-Schmidt

MANUFACTURERS and business men, following closely the movement of the national industrial markets as indicated in the investigations of the National Reserve banks, etc., must have been puzzled by the variation in the views expressed by those agencies on the market outlook and conditions in the different sections of the country. Thus we find reported on the same day that the steel industry is extraordinarily busy, but that the U. S. Steel Corporation is experiencing a considerable reduction in its unfilled orders. Department stores report heavy sales in one city and are almost without business in another. Factories in one and the same industry show variations in turnover which would be unbelievable if similar conditions did not exist all over the country. And, to make the puzzle more confusing, after all these conditions are taken into consideration, after they have been properly valued and placed in their correct relations to each other, there remains this one outstanding fact: the nation's business is not losing ground. There is even evidence that we stand at the beginning of a renewed forward movement. This forward movement will possibly not be a very large one, but the factors that control it have even now produced a noticeable upward movement of the double line, the forecasting line, as seen in the accompanying curve sheet.



The Explanation

For all this there must be some explanation. It stands to reason, for instance, that a nation like ours whose working population has a high income as expressed in individual wages, must always have available a comparatively large sum to spend for luxuries. But high wages alone are not sufficient. Uniform employment is required as an additional factor. If wages remain high due to artificial means, as, for instance, the unionization of any industry, unemployment may still exist. It is the total wage disbursement and not individual earnings that make for national purchasing power.

A reduction in the employment ratio, therefore, may easily lead to a decrease in purchasing power, even if wages themselves remain high. Irregularity in employment, as has been the case during the first three months of the present year, has, no doubt, been responsible for the oscillation in the purchasing sit-

uation. This condition will, no doubt, continue until more regular employment is attained. This will most likely be coincident with the beginning of real spring.

Efforts to Improve Business

Manufacturers and retailers apparently have tried to improve business by making downward adjustments of the prices of merchandise. It is, however, doubtful whether price reductions can really relieve the situation. In the lean years of 1921 and 1922 a condition existed which has often been called a buyers strike. Prices were unattractive and the general consumer was inclined to save his money for better opportunity for spending. This opportunity came and during the year 1923 considerable purchases were made in almost all fields of consumers' merchandise. These purchases rapidly carried the market far in excess of its normal consumptive capacity, necessitating a readjustment late in 1923, which is still in progress.

"Watchful Waiting" Policy Must Be Changed

But this policy of "watchful waiting" can not be continued indefinitely. Either the consumer will get tired of his present attitude or the business world will make a decisive bid for business by offering merchandise, new in character and attractive in price. Common sense seems to counsel the choice of the second method. Even with the slightly reduced purchasing power of the consumer (and his disappointment resulting from the desultory way in which Congress has treated the desire for a change in the tax imposition) a large private reserve of money is left. To turn this purchasing reserve into active purchasing can not be too difficult a matter. It can, no doubt, be accomplished through a really tempting offer. This is a time when optimism should govern the policy of the industrial producer and the retailer. The two should co-operate by pressing upon the consumer their own conception of the situation. To discourage the consumer by insufficient or broken stocks is the worst policy that can prevail.

Bookkeeping Without Books*

A Gas Company's Experience with This System

George F. Myers

Auditor, Sioux City Gas and Electric Company, Siou x City, Iowa

"BOOKLESS Bookkeeping" is now an accepted proposition, and has proven its worth.

The purpose and workings of the system are so familiar by now as to require no explanation on that score, so I am going to give our experience since changing over.

The city is divided into three discount districts, namely, East, West and Central, with payments due on the 10th, 20th and 30th. In changing over we took one district each month, or a total of 10,000 meters, condensed now to about 6,500 accounts, so by the fourth month we were entirely switched over, and now, instead of writing, figuring, comparing and sorting two bills for each gas and electric consumer, we only have one.

Use of Addressograph Plates

One of our big tasks in changing was making over our addressograph plates, so we would only have one plate for a customer using both gas and electricity. In this way we cut down the number of plates from 30,000 to 19,000, which makes quite a saving in this department, as we only have one bill to print each month for a customer using both gas and electricity, and when he makes a move we only have one plate to change instead of two, a saving in space and supplies naturally resulting.

After changing the plates, the route sheets, which are a combination sheet, were printed, and information as to size of meter, date set, and last index billed on ledger was transferred from the ledgers and they then became our permanent record, in place of the ledgers.

Auxiliary Reading Books

It was at first intended that the meter reader should take these books out to obtain monthly readings, but after using them a couple of months it was decided to keep them in the office and use an auxiliary reading book. The head meter reader transfers the readings to the office record. This serves several purposes. It keeps the office record available and in better shape, prevents the possibility of curbstone readings, and places the responsibility of cutting down the number of skip reads and watching for non-register meters on the one person, who is, in the first place, the most responsible for correct readings.

After the monthly readings are transferred to the office record, the books are given to the machine biller, who makes the office copy and post-card bill in one operation. The total consumption of gas and electricity is accumulated in the machine and a proof sheet is made, which is an exact copy of the bills.

The bills are then rubber stamped to fill in the amounts and turned over to the proving clerk, who compares them with the route book, proves consumption against amounts, and enters on sales sheets by routes.

The bills are then turned over to the bookkeepers to have the delinquent and merchandise bills entered, after which the postal or bill part is detached from the office copy and mailed to the consumer, the office copy going in the files to be matched against the coupons when paid, or to take off collection record if not paid.

Filing Paid Cards

All the paid cards are stamped with the date paid and filed in a transfer file in the same order as they were originally, so that this file, together with the delinquents, which are transferred to the new bills,

(Continued on page 482)

*Read before the annual convention of the Iowa District Gas Association.

The Unit Hot Air Heater*

Its possibilities as a gas fired space heating appliance

H. DeWitt Valentine

The Peoples Gas Light & Coke Co.

SPACE heating, using manufactured gas as a fuel, seems to suffer generally because of two specific psychoses. First there is the cost complex, which reacts on the local gas companies only through suggestion by an uninformed public. Secondly, there is the limited diversity and uncertain demand load complex which so disturbs some gas company managements that they suffer almost acute hysteria when the subject of space heating with manufactured gas is even suggested.

Unit Price of Fuel Not a Fair Basis of Comparison

It has been customary in the past, and it still is to that portion of the public and those gas companies who do not take the trouble to be analytical, that the only fair basis for estimating costs of several fuels is by the unit price of that fuel. Naturally to those who have studied the problem, nothing could be more unfair. Due to the extreme variation of character in the several fuels which are commonly used for house heating, the student realizes that there are certain charges that must be placed against other fuels than gas, charges which must be naturally deducted from the gas cost. Such charges are, labor and handling, an increased space charge, a cleaning charge, and an auxiliary charge, which may include gas pilots and electric motors in connection with the use of liquid fuels, etc.

Success Attained Along These Lines

Basing our sales efforts upon the conviction that we were correct in our analysis of this problem, as regards the cost of various fuels, it was only necessary to so distribute our propaganda that the public, our true bosses, would become interested in our business and, after becoming so interested, would believe as we did. That our methods have been successful can be best reflected by the results which have been obtained during the last heating season, during which time we increased our sales over 900 per cent. In Chicago, I believe, this would seem to indicate that the cost of using gas for space heating is not nearly the barrier which even we in former years thought it was. It is quite true that we have had a slight cut in gas used for this purpose, and it is also quite true that possibly this cost cut in gas, though not actually causing this tremendous increase in house heating business, had its contributory effect.

Auxiliary Heating to Be Encouraged

Regardless, however, of opinions regarding the economics of an increased house heating load through the acquisition of central heating plants, it is universally conceded that auxiliary heating is to be encouraged. Radiant type heaters and gas fired radiators are being merchandised by probably every gas company in the United States.

Our desire in Chicago to serve every customer in the most effective manner by suggesting to him the best possible appliance heater for his particular use, caused us to interest ourselves in the Unit Air Heater, as an addition to our group of auxiliary heating appliances.

The Unit Air Heater

This type of heater is not new. It has been used on the Western Coast for several years, either singly or in batteries, for supplying the total heat requirements for dwellings. The climatic conditions in California and other coastal areas makes this, of course, possible. These heaters are in the basement and are vented through a live chimney. The heated air enters the room or rooms through floor or wall registers. There are no objectionable looking appliances, pipes, or fittings visible to disturb the equanimity of the householder—and it gives him the service he desires.

As seen in the figure, the heater is essentially a diminutive warm air furnace, made of sheet metal throughout, the heating surfaces being so designed as to form air heating chambers which are contiguous to passages which carry the flue gases, the path of which are in a counter direction to the path of the air being heated. The air so heated generally enters the heater toward the top through screened openings on all four sides of the appliance. After passing through the screened opening, the air passes between the outer casing of the heater and an inner hotter surface, thus becoming pre-heated to a certain degree and at the same time acting as an insulation against radiation losses. The heated air leaves the top of the heater through ten-inch openings, these openings leading direct to the register by suitable sheet metal stacks and leaders. Each heater generally carries two hot air outlets, and if only one is to be used, either the other is capped or the two are connected by a sheet metal inverted Y.

Regulation of Gas Flow

The distinctive feature of this appliance, however, is not its general construction, but is the electrically operated gas valve, actuated by a remote push button control. The advantages of such a system is apparent to every reader. Consider a unit heater installed in the basement of a bungalow, in which there is an auxiliary heating equipment for the living room; guests drop in unexpectedly on a chilly evening; it is only necessary to touch the button on the wall plate and almost immediately there is a flood of rapidly circulating heated air noticeable; there is no need for matches, stooping or interruptions in conversational attention. When the temperature is equable, another button is pushed, and the gas no longer passes to the burners.

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*Presented at the annual convention of the Illinois Gas Association.

The Cost

Probably one of the first questions which will arise in the mind of the reader will be, "what about installation and installation cost?" He will argue that there is not only sheet metal work to be done and gas piping to be run, but also a certain amount of electrical wiring and conduit work. That is very true, but does not the same condition exist in the sale of central heating plants which are gas fired? Yet we have experienced no great difficulty in consummating such installations to the satisfaction of not only the customer, but to the gas company who merchandised the equipment. It is our custom at the Peoples Gas Light & Coke Company that these auxiliary heaters are delivered to the customer's premises, and at the time the sale is made a charge is made sufficient to cover the installation. We then sublet our part of the contract for doing the sheet metal work, the installation of the register, and the installation of the wall panel and wiring to the appliance. This plan has worked out satisfactorily in our jobs, and there have been many, where we have made sales of warm air furnace installations.

The Selection and Installation of Unit Air Heaters

There is a very general movement in the gas industry towards standardization of equipment and appliances. With our present very keen competitive market it is sometimes difficult to choose equipment from the wide variety offered by manufacturers, and specially if appliances are chosen without any intelligent study and testing. Up to a very recent date, price was the dominant factor in the choice of equipment, but demands for quality merchandise by a discriminatnig public has made it necessary for gas companies to study efficiencies, construction and visual appeal rather than mere cost.

It is very noticeable that two or three tests made on the same appliance by different persons will vary widely in results. One company will report favorably on a certain type of storage water heater, for example, while the engineering department of another organization will condemn it as inferior to competitive appliances. There certainly should not be such a diversity of results if tests are properly conducted. I believe that in most cases a test means a connection of the appliance to a gas line, a determination of the cubic feet of gas used per hour, the temperature of the floor on which the appliance sets, a flue gas temperature determination, a carbon monoxide test of uncertain technique, and finally an efficiency (?) test. Such a test is valueless. Definite results will be secured, it is true, but if the same appliance were tested in some other laboratory the chances in variation of results would be almost certain.

The Controlling Operating Factors

If an appliance has inherent several operating factors, each factor having its contributory effect on the overall efficiency, then in order to successfully study and interpret the effect of each such factor, all save one must remain constant while the one is allowed to vary. By selection then the variable factor becomes a constant and is so used while another factor is caused to vary. In this way each factor is in turn allowed to vary until a value is reached which will be contributory to the highest overall efficiency when coupled with the other factors. In other words, each variable factor becomes a constant, the value of which should be duplicated in every installation to get the best results.

Gas Burning Capacity

There is a certain relation between the burner capacity, heat absorbing surface, and efficiency. Inasmuch as the heating surface is fixed, it is possible to vary the quantity of gas burned per unit of time from zero to the maximum which is determined by the limits of complete combustion. It is always necessary, of course, to adjust the quantity of primary air with the volume of gas burned. All other factors remaining constant, there will be one point where the maximum efficiency, under these conditions, will indicate a certain gas consumption per hour.

Secondary Air

Air has a heat capacity of 0.24 B.t.u. per pound, or 18 cubic feet at 250 deg. F. A heater burning 60 cubic feet of gas per hour requires approximately 360 cubic feet of air per hour for complete combustion. If through the infiltration of secondary air, 200 per cent excess air develops, 720 cubic feet (theoretically) of air will unnecessarily pass up the flue. Heating this air from 60 deg. F. to 250 deg. F. will cause a heat loss of approximately 6 per cent of the total heat input. This can be materially reduced by closing off secondary openings, which openings will be either part of the design or present because of careless assembly. The limit to which secondary air can be reduced is that point where the outer sheaths of the flame stools are lazy, due to the absence of a suitable air envelop. At this point carbon monoxide is apt to form.

Area of Heat Absorbing Surface

This is discussed above where it is assumed that the area of the heat absorbing surface is fixed. If the question is one of design, it is important to remember that, at least hypothetically, the greater the contact, with respect to surface area, between products of combustion and air to be heated, the more complete will be the heat extraction. It must be borne in mind, however, that as heat is extracted from the flue gases and their temperature drops, the density will increase and approach that of the outside air. Inasmuch as draft depends on this difference in density, the limit to which heat may be extracted is that point where the flue gases fail to leave the appliance completely and where the flames begin to "float."

Draft Intensity

This is really a corollary of the preceding paragraph and needs no further discussion, except that in an appliance already designed and assembled, draft should be so regulated as to save a high flue loss. This can be accomplished by damper or draft hood auxiliaries.

(Continued on page 492)

INDUSTRIAL GAS LESSONS

IF IT'S DONE WITH HEAT YOU CAN DO IT BETTER WITH GAS

Lesson No. 21

Wave Motion

The Ether and Wave Motion

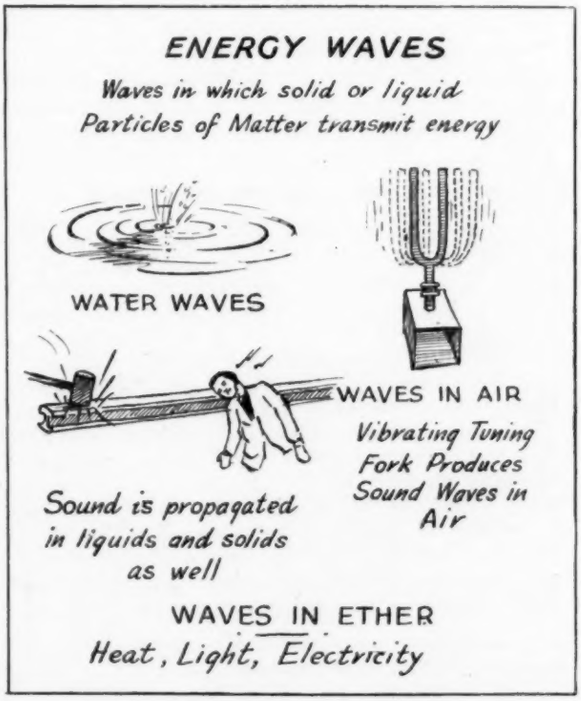
There is evidently some agency which acts in both cases, in the case of heat and in that of electricity, to form a medium for the transmission of energy through a vacuum. In other words, matter, that is, air, water, metal, any material substance, is not involved in this process, for the phenomena takes place in a vacuum where there is no matter. This agency is known as the ether. It is the ether that acts as the carrying medium in transmitting the heat of the incandescent filament to the glass bulb, the radio current through the air, the electricity through the vacuum of the X-ray bulb. What ether is is not known and what it can and does do are also not so well understood, but it serves to explain how heat is transmitted through a vacuum and when such an action takes place, as it will, under almost any conditions—that is, when a substance loses heat by the mere fact that heat waves are radiated from it—heat energy is set free and carried through the ether to heat up other substances that come in contact with it. That is the way in which the heat of the sun is transmitted to us. For almost the entire twenty-three millions of miles that the heat is radiated from the sun (the atmosphere is only fifty miles high at the most) the heat rays are carried by the ether. When the radiated heat comes in contact with the air the latter is of course heated up and a certain amount of heat is transmitted from place to place by the movement of the atmosphere.

The Three Forms of Waves

There is still another aspect of heat radiation that must be considered before proceeding with calculations of the quantity of heat that is radiated and the conditions which control the same. It has been mentioned that heat is radiated in waves from the hot body. There are three forms of waves. One of these and the most easily understood are the waves that are formed in water by various causes. Thus, if a stone is dropped into a still body of water, a series of concentric waves, emanating from the center, which is marked by the point at which the stone struck the surface of the water, is formed. These grow larger and larger and if the original impulse was strong enough the waves may eventually attain the edges of the pond and finally disappear there. The waves in the sea are of similar character.

Water the Medium of Energy Transmission

The water acts as the medium for the movement of a certain amount of energy, caused by one phenomenon or other, the dropping of a stone, the wind


ENERGY WAVES
Waves in which solid or liquid Particles of Matter transmit energy
WATER WAVES
WAVES IN AIR
Vibrating Tuning Fork Produces Sound Waves in Air
Sound is propagated in liquids and solids as well
WAVES IN ETHER
Heat, Light, Electricity

due to a storm, the tidal action of the moon, etc. This energy is dissipated in the movement of the water and the waves become less and less strong, the further they are removed from the original source whereat the impulse was given. The motion of waves in water is also exemplified in the action of the wind rustling a field of grain. In both these actions the particles of matter do not move at all, but the energy which is carried by one nearest the point where the impulse was given is transmitted to the next in contact with it, and so on. Thus, a contin-

uous movement is attained and it appears as if the particles of matter itself, water, for instance, are being moved. Of course, in tidal action and in the breaking of the waves on the seashore, the water does move to a limited extent.

Waves in the Air and in Ether

Waves can also occur in air. Sound waves are air waves and when there is no air present there is no sound. In other words, sound is propagated, moved from place to place, by the generation of waves in the medium, air. There can be no sound in a vacuum, for there would be no air to carry it, and hence the ear would not hear any sound that might be produced. It must be understood that a sound wave does not mean the movement of air in the same sense that a fan produces a draft by blowing the air from one place to another. When sound is produced, say when a tuning fork is struck, the vibrations of the fork cause a compression of the air in one direction and a rarefaction of the air in another direction. In other words, the air is actually squeezed together and then drawn apart, it might be said, in regular alternations which follow each other at a rate of about 1,100 feet per second. These compressions and rarefactions proceed from all sides of the fork and are known as sound waves. The fork is at the center of a series of waves that emanate from it and the waves are circular in cross-section.

All Substances Transmit Sound

Sound waves are transmitted not only by air but by any elastic medium, such as water, wood, the metals, etc. The rate at which the sound waves move is known as the velocity of sound. The velocity is least in the case of air or other gases, and greatest in the case of metals and other solids.

Before leaving this subject it must be emphasized again that sound waves do not imply the movement of the air. Sound is not propagated by air currents. It is simply wave motion in which the air acts as the carrying medium for the transmission of sound energy. Perhaps this will be most clearly understood by calling to mind the fact that a metallic rail will transmit sound, a fact that can easily be proven by experiment, and in this case there is no question that the particles of the steel rail do not move.

BOOKKEEPING WITHOUT BOOKS

(Continued from page 478)

are as complete a record of the month as when first compiled.

At first it was the practice to have the paid coupons as they came from the cashier matched daily with the cards, but last month we tried the experiment of having the coupons for the discount period, which was then due, held ten days by the bookkeepers before posting, and at the end of the discount period they are compared with the office record. In this way about 80 per cent are pulled at one time, instead of going through the cards and pulling out a small bunch each day. This also serves another purpose. That is, by not having to do any heavy posting each day on the current bills, the bookkeepers can put more time on collections past due in the other two districts, before it is time for a new bill.

Bills for Special Readings

All bills for special readings, taken after regular reading date, or shut-off meters are entered by proving clerk on a special charge sheet, which is footed at the end of the month, and the totals by routes are carried forward to the regular sales sheets, which, after being added to regular readings, form the figures for the monthly journal entry.

The sales are taken off as net, all discounts or previous month's sales which are forfeited by consumers, being added to current month's sales. The balancing is done by routes, there being ninety-seven, and for this purpose all sales, cash, credits for over-readings, etc., are kept by routes during the month.

Advantages of System

First: It saves the time and expense incurred by transferring ledgers every year or eighteen months, as the case might be, and the upsetting of the regular office routine at transferring time, which is also an item worth mentioning.

Second: Collections can be watched and collection notices made up more easily, as it is not necessary to look over 85 per cent of the accounts, which are paid, to get the 15 per cent which have to have first notices sent out. Also, in our case, we have the gas, electric and merchandise bills on one card, so it is easier to see a customer's status than when using separate ledgers, and we can better determine what methods of collection are necessary.

Third: The cards are more convenient to handle than the ledgers, as when one clerk was using a ledger he would withhold about 2,000 accounts from the other clerks, which is not true of the card system.

Fourth: The records with the card system are so much more legible, as all work is typewritten or rubber stamped.

In closing, I am pleased to say that we are very much satisfied with the results already obtained by us, and as we are still making minor changes and improvements, by the end of our first year we hope to be getting results not possible with the ledgers; and to all who might be interested in seeing the workings of the card system, we will be pleased to have them come to our second floor office, and we will more thoroughly explain the details and furnish samples of various forms used to the extent that they might aid in the installation of a like system.

As The Journal Views It

THE INDUSTRIAL SURVEY

Industrial gas has come to stay. There is scarcely any doubt about this, and it is perhaps entirely unnecessary further to discuss this matter and to dwell on the benefits that will accrue to the gas company through the development of the industrial gas field. The time is past when it is any longer necessary to argue pro and con on this subject.

If such is the case, and if there is great business to be obtained along industrial lines, the natural question that every gas company must put to itself is how to go about to obtain it; what must be done in order to develop the industrial gas field; how can the industrial department be started and business be obtained?

This is something that every gas company contemplating going into the industrial field must face. Plans must be laid for opening up the channels through which such business can be obtained.

It is natural that before you can sell you must know who will buy, and this is the first step that any gas company must take before it can actually sell industrial gas. In other words, the gas company must find out what the market is for its fuel in the community that it serves. It must make an industrial survey of the field, for in that way only can it determine for itself what the prospects are for the introduction of gas as a fuel in the various industries that are found in its locality.

For some reason or other, probably due to the trouble and expense of making such a survey, the project has been side-tracked by gas companies. They have been rather reluctant to undertake such a task. They may have felt that this work was not altogether necessary and that just as good results could be obtained without an industrial survey.

In a small community, where the industries are but few and well known, this may be so, but in the average-sized community served by a gas company this is not at all the case. For there are many prospects that will never be dug out unless a scientific survey is made covering the entire field. The value of the information gathered in this manner and thereafter scientifically collated, and then put to practical use, well repays any expense and trouble that are taken in making the industrial survey.

The use of gas as an industrial fuel is fraught with all sorts of conditions and difficulties which are not found in the domestic field. Each industrial plant has its own peculiar conditions, and the manufacturing processes used require special attention and particular consideration, when the existing fuel is to be replaced by gas.

The gas company cannot go into this field in a haphazard manner and expect to make a success. This applies to the first step in starting an industrial department as well as to those that follow. If the gas company goes after this information in a logical manner, if it procures data regarding each individual prospective customer, and covers the field completely, it can then formulate its plan in a clear, concise fashion, and the chances of success are immeasurably greater than when it sends out a salesman to try to make customers by literally digging them out or through sheer force.

The industrial gas business is a great business. The opportunities are enormous. There are innumerable industries and processes in which gas can be used as a fuel. As competition becomes greater, and the quality of the finished product becomes more exacting, manufacturers will turn more and more to scientific methods of manufacture and to the use of the best that there is in raw materials and fuel.

Gas is the best fuel. There is no question about that. It is the most economical fuel; it is the fuel that can be most scientifically used and controlled. The field is open to the gas company, and it must make up its mind to approach the problem in a scientific manner. It must not be content with haphazard methods. It must be willing to devote time and money correctly to build this business structure, so that it will stand for all time.

And the foundation of this structure, the foundation of a successful industrial gas department is a collection of complete and scientific recorded information regarding prospective customers. This can only be secured by making an industrial gas survey.

RULES AND REGULATIONS

Governing Sixth Annual Exhibition of American Gas Association, Atlantic City, N. J., October 13th to 17th Inclusive, 1924

The exhibition is under the management of the Manufacturers' Section of the American Gas Association.

Only company members in good standing may exhibit.

No application will be considered unless dues have been paid.

Exhibitors must file an application for space with the secretary of the exhibition committee, indicating thereon the number and location of booths desired.

Allotment of space will be made by the exhibition committee in the order in which applications are received.

The exhibition committee reserves the right to make such adjustments of space allotments as it may deem necessary.

The number, size and location of booths will be indicated on the notice of allotment.

A payment of $25.00 must accompany each application for space, the balance to be paid within thirty days of the date of notification of space allotment. Any exhibitor who shall fail to make the final payment within thirty days from the date of the allotment shall at the option of the exhibition committee forfeit his rights in and to the use of such space, as well as the amount already paid, and the exhibition committee shall have the option to dispose of such space as it considers for the best interest of the exhibition.

The rental price includes booth railing, and sign designating the name of the exhibitor. Additional decorations or signs will only be permitted on approval of the exhibition committee and will be at the expense of the exhibitor.

No additional charge will be made for gas, water or electric current used in reasonable quantities for demonstration purposes.

No exhibitor shall assign, sublet or apportion the whole or any part of his allotted space.

Exhibits shipped via freight must be crated and shipped, transportation charges prepaid, to the exhibitor himself, care Eldredge Express & Storage Warehouse Co., Atlantic City, N. J., and must have the space number plainly marked thereon.

Exhibits shipped via express must be shipped, transportation charges prepaid, addressed to the exhibitor himself, Steel Pier, Atlantic City, N. J., and must have space number plainly marked thereon.

Original B/L should be sent to Eldredge Express & Storage Warehouse Co, Atlantic City, N. J.

All exhibits must reach Atlantic City not later than October 9.

All cartage will be charged to the exhibitor.

All exhibits must conform to the size of their space.

On arrival of exhibits at the Steel Pier, the exhibition committee will take charge of same, unpack and install under the personal supervision of the exhibitor's representative.

Exhibits of a nature that obstruct the view and interfere with the privileges of adjoining exhibitors will not be permitted.

Erection of backwalls in interior booths will not be permitted except by agreement between the two abutting exhibitors, and in such case their height will be limited to seven feet. In no case will walls at the sides of booths be permitted.

All exhibits must be complete and in place by midnight, October 11. No work of any nature will be permitted on the exhibition floor after that time except in the case of exhibits received after the opening of the exhibition. These must be arranged in their booths prior to 9 a. m. each day.

The executive board of the American Gas Association has ruled that souvenirs are not to be given away by exhibitors at the 1924 convention and exhibition.

All advertising matter, with the exception of catalogues, must be approved by the exhibition committee before being distributed.

The exhibition will open on Monday, October 13, at 10 a. m. It will be open each day from 10 a. m. to 6 p. m. The exhibition will close at noon on Friday, October 17.

All exhibits must remain in place and intact until noon, Friday, October 17, when the exhibition committee will recrate and ship them in accordance with instructions furnished by exhibitors.

To facilitate this work all crates must be made of strong and durable material and must be screwed together and have shipper's name marked thereon to insure their identification.

No material may be removed from the pier at any time without the written permit of the exhibition committee.

Neither the Manufacturers' Section of the American Gas Association nor its representatives shall be held responsible for any injury to exhibitors or their employees, nor for the loss of or damage to any goods from any cause whatsoever while on exhibition or while in transit to or from the Steel Pier.

E. P. BAILEY, JR.
E. V. DAILY
C. W. WARDELL
G. WIBERLEY
G. W. PARKER, Chairman
C. W. BERGHORN, Secretary.

Exhibitors are urged to file their applications for space promptly in order to have their names included in the exhibition directory which the association will publish.

Catechism of Central Station Gas Engineering in the United States

Installment No. 21

(Continued from last week)

Continuation of Calculation

Having determined this, the next step is to obtain the area of the trapezoid immediately above the triangle. To do this, measure the length in inches of each of its two parallel sides, add these lengths together, divide the sum by 2 and multiply the quotient so found by the length of the perpendicular between these sides, which will be either ½ in. or 1 in. The product is the area of the trapezoid. Multiply this by the length of the tank in inches and divide by 231, and the quotient is the number of gallons contained in the portion of the tank included between two planes parallel to the axis and passing through the upper and lower sides, respectively, of the trapezoid. The sum of this number and of the number previously obtained is the total number of gallons in the tank when it is filled to the same height as the upper side of the trapezoid. In the same way the number of gallons that the tank will hold for each strip represented by a trapezoid can be determined and added to the total number of gallons for all the strips below it to get the total content of the tank up to that point. When the contents have been figured for each inch up to the center, those for each inch above the center can be obtained by adding, one at a time, the volumes of the corresponding strips as already determined, since each strip in one semicircle will have its counterpart in the other.

For the tank specified in the question the triangle judged to be equivalent to the segment with a height of ½ in. has a base of 9.22 in. and an altitude of 0.73 in. Its area is therefore $9.22 \times 0.365 = 3.37$ sq. in. In the trapezoid immediately above it the lengths of the parallel sides are 9.84 in. and 13.78 in. respectively, and the perpendicular distance between these sides is ½ in. Its area is therefore $\frac{9.84 + 13.78}{2} \times \frac{1}{2} = \frac{23.62}{4} = 5.9$ sq. in. and the total area of the segment with a height of 1 in. is $3.37 + 5.9 = 9.27$ sq. in. The length of the tank is 20 ft. or 240 in., so that the volume contained when it is filled to a depth of 1 in. is $9.27 \times 240 = 2224.8$ cu. in., and the content in gallons is $\frac{2224.8}{231} = 9.6$ gallons. Working in this way the number of gallons contained for each inch in depth of the oil can be found and a table made up from which to determine the content for any given measurement.

The Graphical Method

The areas of the different segments can also be calculated by any one of the several rules given in engineering handbooks, but it takes much longer to do the work in this way than by the graphical method and the errors in the results obtained by the latter are well within the limits of error due to inequalities in the tank itself. For tanks over 8 ft. in diameter, however, the graphical method can hardly be used on account of the difficulty of finding a suitable surface sufficiently large to hold the drawing.

Oil Tar Separation

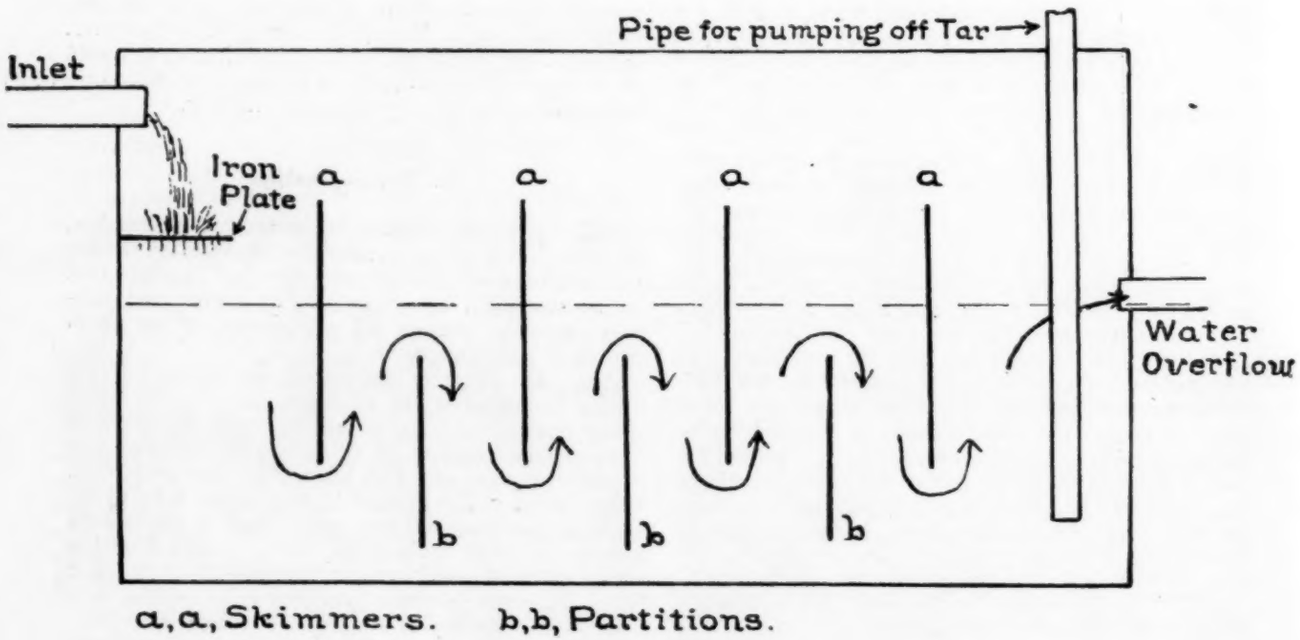
116. Give a description, illustrated with sketches, of some form of apparatus for separating the oil tar produced in the manufacture of carburetted water gas from its accompanying water, the purpose being to remove all appearance of tar from the works' drainage.

Ans. An effective apparatus for separating the oil tar produced in the manufacture of carburetted water gas from its accompanying water is shown in the cut, and consists of an oblong rectangular box of wood or iron, say 4 ft. wide, 5 ft. deep and 16 ft. long, buried in the ground to such a depth as to receive all washbox and drip water, and to empty into a sewer or other drain. This box is provided with a series of cross partitions at intervals of 18 in. or 2 ft., every other partition reaching from within, say, 5 in. of the bottom of the box, to within 4 to 6 in. of the top surface of liquid in the box. Alternating with these partitions are others which reach from within 2 ft. of the bottom of the box, up above the surface of the liquid, and are called skimmers. The liquids to be separated are admitted at one end into the box (if possible from a height of several feet), falling on an iron plate and thence flowing through the separator. This striking of the tarry liquids on an iron plate helps to break up the vesicles of tar and water. Another way would be to urge the stream of tarry water against a plate by the aid of a steam jet. The liquid flows, the slower the better, over and under the partitions, each reversal of current helping to precipitate the tar to the bottom; any light oils come to the top surface, and are held by the skimmers until removed.

The wider and deeper the box, the slower the motion of a given quantity of fluid per hour; the longer the box, the more complete the separation. The higher the bottom of the skimmers from the bottom of the box, the greater the capacity of the box to hold the separated tar between periodical draw-

ings off. The bottoms of the other partitions are only above the bottom of the box, to enable accumulated tar to be drawn off from one end; the tar will never be completely drawn off, so that there is no danger of liquid flowing direct from one end of the box to the other under the partitions.

The bottoms of the skimmers should not be too high above the bottom of the box, however, for the total depth of box, or the zigzag reversals of current would be too slight. Keep the box covered with hatches, and if necessary warm with steam pipes in winter to keep the temperature about 150 deg. Fahr.



Tar and Water Separator

Fuel Value of Oil Tar

117. What is the fuel value of the oil tar produced in the manufacture of carburetted water gas, and, consequently, what is the price that should be obtained per gallon to make it worth while to sell, intsead of burning it? The price of steam coal may be taken as $3.50 per net ton.

Ans. The only information that has been published, as far as is known to the Trustees, as to the fuel value of the oil tar produced in the manufacture of carburetted water-gas is that given in a paper, "The Fuel Value of Residuals," read by Mr. Chas. F. Prichard at the meeting of the American Gas Light Association in 1901.

Mr. Prichard took as a basis of value a first-class steam coal having a calorific value of 14,385 B.t.u. per pound and giving an evaporative duty per pound, under every-day working conditions in the boilers of an electric light plant, of 9.8 lb. of water from and at 212 deg. The cost of this coal is, in the question, assumed as $3.50 per net ton.

Bomb Calorimeter

The calorific value of the oil tar used by Mr. Prichard, as determined by a bomb calorimeter test, was 17,193 B.t.u. per pound, and the average evaporative efficiency per pound, when used under boilers under the same conditions as the coal, was 14.9 lb. of water from and at 212 deg. As the weight of a gallon of this tar was 9.58 lb. the weight of coal equivalent for use as boiler fuel to a gallon of tar can be found from the proportion $x : 9.58 = 14.9 : 9.8$ according to which $x = \frac{9.58 \times 14.9}{9.8} = 14.56$ lb. Since the coal is worth 0.175c. per pound the value of the tar for fuel purposes is 0.175c. $\times$ 14.56 =2.5c. per gallon, and if it cannot be disposed of at this or a higher price it should be burned.

Mr. Prichard's paper can be found in the Proceedings of the American Gas Light Association, Vol. XVIII, page lxxvii; in American Gas Light Journal, Vol. LXXV, page 807, or in Progressive Age, Vol. XIX, page 517.

Part 3. Common to Both Coal and Carburetted Water Gas

Unloading Coal from Barges

118. Describe briefly and generally some system of machinery for unloading coal from barges and depositing it in the coal shed.

Ans. Every system of machinery for unloading coal from barges and depositing it in the coal shed is composed of two parts, one for taking the coal from the barge and depositing it upon the dock at some point, usually at a high level, from which it can be taken into the shed, and the other for transporting the coal from such point of deposit to the proper position in the shed.

For the unloading proper the simplest combination is a mast and boom hoist worked by horse power, and using buckets, or tubs, that have to be dumped by hand. But when any large amount of coal has to be handled the hoisting is done by steam. The average apparatus consists of a steam hoisting engine fixed on the dock, and a derrick movable along a track laid along the dock parallel to the water line, and carrying an inclined boom, a traveller free to run in and out on the boom, a coal hopper, a working platform on a level with the tracks in the coal shed and fitted with a continuation of these tracks running over a platform scale, and the necessary pulley blocks to guide the hoisting rope along its path from the engine up to the top of the derrick, over the inside end of the traveller and around the loose block carrying the hoisting hook, to point of final attachment on the outer end of traveller.

Very frequently a boiler is part of the plant, but in most gas works it is cheaper to pipe steam from the main boilers to the dock, than it is to use a small separate boiler for the purpose.

Construction of Hoisting Apparatus

The hoisting engine is made with two cylinders with pistons connected to opposite ends of a shaft by cranks set at an angle of 90 deg. with each other. The hoisting drum derives its motion from this shaft by friction gears or by toothed gearing and a friction clutch against which the drum is pressed by any suitable means, such as a lever turning a screw with threads cut to a very rapid pitch, the point of the screw being fastened to the drum, so that a quarter revolution of the lever carries the drum from no contact to full friction. Braking, when lowering tubs, is accomplished by holding the drum more or less tightly against the clutch, and a load is held stationary by pressing the drum tightly against the clutch with just enough steam admitted to the cylinders to prevent motion in either direction, or a special brake may be provided. The throttle valve handle and friction lever are so arranged that the first can be worked with the left hand, while the second is handled with the right; the brake, when one is used, being worked by the foot.

The derrick is usually framed of wood, iron being sometimes employed in later construction.

Operation of Apparatus

The operation is as follows: The derrick having been moved opposite the desired track in the coal shed, the wheels on which it travels are clamped, guy ropes fastened, and the boom swung out with stop set so the traveller will be held at the proper distance from the dock when the tubs are lowered. The full tub, holding about ½ ton of coal, is hooked on and the engine started. The tub is raised vertically, until the hook block is brought tight against the traveller. As the winding up of the rope continues the traveller is drawn in and up along the boom, until the tub, made self-dumping by having the points of attachment of the handle below its center of gravity when loaded, is brought against a tripper that raises the back lever catch and turns over, emptying the coal into the derrick hopper; the tub when empty righting and locking itself in readiness to be run out with the traveller and lowered, when this comes to rest against the stop, as its weight unwinds the rope from the drum.

The Conveying System

The second portion of the system, that for transporting the coal from the derrick hopper to the place of deposit in the coal shed, consists simply of the necessary tracks and cars propelled by hand, or gravity; the cars, filled by a shoot at bottom of the hopper and weighed, being in the first case run into the shed, and dumped, by hand. In the second case the tracks are laid to slope down from the derrick, and as the loaded car runs down the incline it picks up, at the proper point, a stop set on a rope attached to a heavy counterbalance weight free to rise and fall through a certain distance. The momentum gathered by the loaded car in its descent is sufficient to raise this weight, and the car being dumped automatically soon after picking up the rope, the lighter weight of the empty car is overcome by the resistance of this counterbalance weight, which then falls, giving the

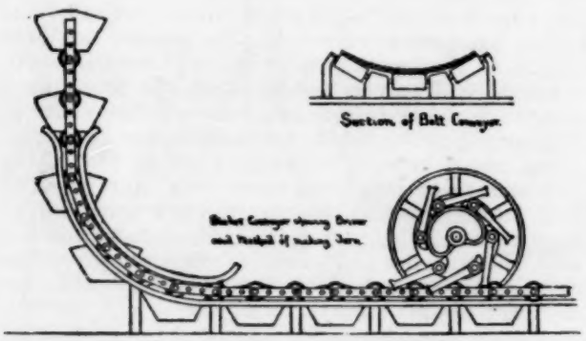
car sufficient impetus to carry it back to the starting point on the derrick.

Conveyors or cable railways are also used to carry the coal into the shed.

Coal Handling Conveyor

119. Give a description, illustrated with sketches if necessary, of some form of conveyor suitable for handling either anthracite or bituminous coal in the condition in which it is usually received at a gas works.

Ans. One form of conveyor that is extensively used for handling coal consists of a series of buckets linked together by two chains made of heavy steel bars, the buckets being pivoted between the chains in such a way that they are always kept upright by gravity, no matter whether the chains run horizontally or vertically or at any angle between horizontal and vertical. When travelling horizontally or along an inclination the conveyor is supported by wheels set between the bars of each chain and running on a track, but when travelling vertically it may be allowed to hang free. Changes of direction from horizontal to vertical are made by giving the proper curve to the track. The size of the buckets is regulated by the size of the coal to be carried and the rate at which it is to be handled.



The chains are driven by pawls arranged around a wheel and guided by a cam, and engaging with pins provided for the purpose along the chains, the power for turning the pawl-wheels being usually derived from a small double cylinder engine. This driving arrangement can be put at any point of the chain wherever it is most convenient to have it.

The buckets can either be entirely separate or else made so that when running horizontally the edges of adjacent buckets either touch or overlap. In the latter case material can be spouted into the conveyor in a constant stream without danger of any falling between the buckets and being wasted. For the separate buckets special fillers are used to put a fixed amount in each bucket and prevent any loss between the buckets. At the proper point a dumper upsets and empties the buckets either directly on to the pile underneath or into a shoot. Both fillers and dumpers are movable and can be set at any desired points on the horizontal runs.

Horizontal and Vertical Conveying

With this form of conveyor coal can be carried both vertically and horizontally and there is no necessity for providing separate elevators. On the cut is shown the driving mechanism and the arrangement of buckets, chain and track.

Another form of conveyor frequently used for coal consists of an endless belt driven by ordinary belt pulleys and supported and made to assume the form of a curved trough by numerous sets of three rollers each, one of the rollers being placed horizontally under the middle of the belt and the other two, one under each side of the belt, set slightly higher and at an acute angle with the horizontal. The coal is delivered on to the belt by a spout and dumped at any desired point by a movable dumper composed of a frame carrying pulleys around which the belt passes in such a way that it overhangs and the coal drops off into a shoot.

This form of conveyor can only work horizontally or at a very slight angle and along straight lines, requiring the provision of an elevator for vertical lifts, but for horizontal work it is efficient and can be installed at a comparatively small cost.

Choice of a Boiler

120. If you had to install a new boiler plant, what general considerations would influence your choice of type of boiler to be used?

Ans. The principal general considerations influencing the choice of type of boiler for any particular installation are, the location and space available; the kind and cost of fuel; the nature of the feed-water; the steam pressure to be carried; the facilities for having repairs made, and the first cost of the boiler and cost of maintenance.

A few applications of these considerations may be indicated.

When the feed-water is such as to cause considerable deposit in the boiler, it is best to choose the simple cylindrcal form, or a simple flue form, on account of the ease with which these types can be cleaned. The ability to obtain a good fuel at a low cost would also lead to the same choice, owing to saving in interest on first cost more than counterbalancing loss of economy in fuel. Difficulty in having repairs made would also lead to the choice of these types.

With higher prices for fuel and better feed-water, the more complicated flue or tubular boilers are selected on account of greater fuel economy, and under the same circumstances the necessity for such a location of the boiler as would make the results of a possible explosion particularly disastrous, would dictate the selection of one of the so-called "safety" or "sectional" boilers, even though cost and other considerations weighed against its adoption.

(Twenty-second Installment Next Week)

GAS MERCHANDISING

Domestic – Industrial

Youthful Appeal Helps Sell Gas Appliances

A live suggestion to the sales manager

Frank H. Williams

DAN THUMMA, the youthful, but highly successful, manager of the sales room of a middle western gas company, was talking to his friend, Fred Simpson.

"Fred," said Dan, "do you notice any particular change in the sales room?"

Fred looked around the room interestedly. His glance took in the attractive displays of appliances, the clean and well lighted room, the interesting and cozy atmosphere of the place, and then he slowly shook his head.

"No, Dan, I can't see that you've changed the place any. It's still the snappy, up-to-the-minute place that it always was."

"Then you haven't noticed Miss Jennings, our new saleslady?"

Fred smiled at this.

"Well, to be perfectly frank, she's just about the first thing I did notice when I came in here. She's about the best looking plate of peaches and cream I've cast my optics on for quite a while. Where in the world did you get hold of her?"

"It's not so important where she came from as what she is going to do for this sales room," Dan answered. "I figure she's going to be a big help in putting this business over bigger than ever. Come around to my office and sit down and take a weight off your feet and let me tell you why I think she's going to be such a help and why the youthful appeal is the best slant to take, in my opinion, in selling gas appliances."

A little later the two men were seated in the corner of the room where Dan's desk was located and where he could see everything that was going on in the room and also overhear most of the conversation.

"My idea is this," said Dan, leaning back in his chair. "It is the young people—the people under forty—who nowadays are the main buyers of things, and so it is to the people under forty that we must cater in this business if we are going to sell gas appliances in the volume we want to sell them and if we are going to sell more and more appliances from year to year.

"Let me first tell you why I've come to this conclusion and then show you how I am cashing in on the proposition.

Youthfulness the Best Proposition

"I got this idea about youthfulness being the best proposition for us in the selling game when I saw an advertisement published by the national advertising department of a big metropolitan newspaper. I've still got that ad. with me. Let me read some of the things it says."

Dan pulled a much thumbed and creased piece of paper out of his pocket as he spoke and from it read as follows:

" 'Youth must be served.

" 'Youth wants the up-to-date things, the modern things, the time and labor savings things—price is a secondary consideration.

" 'The man or woman under forty may have less than the older person, but they spend more.

" 'The older generation are not big buyers of new things for this reason: They already have the necessary things. And they do not take to new things because age has established habits and is not venturesome.

" 'It pays to build a business that appeals to people under forty and to people who THINK under forty.' "

Dan folded up the paper after reading it, and smiled again.

"There's more to it," he said, "but I've read you enough to show you the gist of the whole thing.

"This advertisement, as I say, made me stop and think and it made me feel that it will be best for us in this business to concentrate on a youthful selling appeal for these reasons:

Why the Appeal to Youth Is Advantageous

"First—There are more young people than there are old people by two or three or more to one. Consequently, we have two or three or more chances of making sales to young people than we have of making sales to old people.

"Second—There are more new homes being occupied by young people than there are by old people; so by concentrating on a youthful appeal we will appeal to the furnishers of more new homes than would otherwise be the case.

"Third—Young people have more acquaintances and friends than older people and get more and do more talking, and so, if the young people start boosting us we will get more business than if the old people were our strongest boosters.

"Fourth—Young people buy things with less fuss and worry than older people, and so there is less sales resistance in dealing with young people and those who THINK young than there is in dealing with older people.

"All of which is, to my mind, a pretty convincing bunch of reasons why it is best to cater more strongly to young people than it is to cater to the older people.

"So, having come to this conclusion, I have tuned all our selling efforts to the idea of interesting the young folks.

"And one of my very first steps has been to replace that elderly lady who was our sales person with the young lady who took your eye at once when you entered the room. I have done this for several reasons. It is easier for a young person to sell a young person than it is for an older person to do so. A youthful sales person in a store room gives a youthful appearance to the whole place and attracts business. And a young sales person puts more pep and enthusiasm into the work than an older person does.

"That is one of the things I've done in concentrating on a youthful appeal in selling goods.

The Youthful Appeal in Advertising and Window Displays

"Another thing I've done has been to emphasize the fact in all of our advertising and window displays that the use of our appliances KEEPS the users young.

"It is my opinion that one of the strongest sales appeals is that the use of an object will enable a person to keep young and look young and feel young. The great majority of older people would like to look young and be young again. So when I tell them that by using our heaters and ranges and so on they will be doing something that go far toward making them young again, I am injecting a very powerful appeal into my selling efforts.

"And what I say is true, of course. The use of our appliances in place of old-fashioned coal ranges and old-time methods of heating water by putting buckets of water on the stove, will save work and time and worry, and so will keep people young.

The Appeal in Show Room Placards

"Another thing I am going to do is to get a much more definite youthful appeal in all of the placards we use in our show windows and inside the store. For instance, on a placard giving the price of a heater, when shown in the window display, I'll have some such lettering as this: 'Why This Heater Appeals so Strongly to Young People and to People Who Stay Young.' Then under this heading I'll list all the various points about the heater which make a particularly big hit with the young people. And so on with all the other appliances we sell.

"Everywhere possible I am going to appeal to the young people and to the people who think young and I am absolutely sure it is going to help us get more business."

All of which, unquestionably, contains some important points of real interest to gas appliance sales managers and sales people and all of which is submitted in the hope that it will help various companies in selling more appliances and in making more money out of such departments.

Advertising as an Aid to Selling Gas*

The forms of advertising and their function

John Paul Lucas
Charlotte, N. C.

ANY discussion of advertising in the gas field must presuppose good gas service. And any intelligent discussion must be predicated upon an understanding of what good gas service is.

A high standard of gas service means more than gas of a proper calorific value, delivered at a satisfactory pressure. These are the first essentials, of course, but "service" has come to embrace a larger meaning than it did even a comparatively few years ago. There must be the right sort of spirit in the organization which supplies gas service. There must be the right sort of contact with customers and with the public generally.

*Presented at the Sixteenth Annual Meeting of Southern Gas Association.

The Matter of Complaints

Take the matter of complaints, for instance. The complaint man should not only handle complaints promptly, but he should maintain such an attitude as will convince the customer that he may confidently and at all times expect not only a square deal, but a courteous, friendly and interested hearing. Superficial politeness in a complaint man isn't enough. He must be sincerely interested in the service the customer gets, and appreciate the importance of keeping customers satisfied and pleased with the service.

Other contact points are of no less importance than the complaint man. Every service man and every salesman must radiate that same spirit if our customers are to be convinced that we are really interested in giving them the highest standard of serv-

ice possible. Every member of a gas organization should realize the fact that no complaint is too small and no evidence of dissatisfaction too insignificant to receive courteous and interested attention.

One of the most successful gas appliance salesmen I ever saw displayed to me once a pair of plyers and a screw-driver. "Here are my best sales aides," he said, explaining that the impression made upon housewives by offering to inspect and make adjustments of ranges or other appliances, and the making of such adjustments when they were needed, often led to sales. The recipients of such services as these are almost invariably boosters.

Straight Commercial Advertising

In gas advertising the most direct and sales-producing results are from the straight commercial advertising of appliances. This advertising is most effective when the company handles only such appliances as it is willing to back to the limit and then advertises and emphasizes this point.

Probably the most effective advertising that can be done by a gas company is what may be termed educational advertising. This form of advertising contemplates the instruction of the housewife in the most efficient use of gas; in the advantages of gas over other forms of fuel; of its economy, labor and drudgery-saving qualities, and its other advantages.

The Medium of the Newspaper

For this class of advertising, as well as other classes, the local newspaper presents a most effective and valuable medium. Another most effective means of putting over this class of advertising is through properly conducted demonstrations. Unquestionably the most effective demonstrations we have ever held on our system have been those at which the planning of meals for the conservation of gas was a prominent feature. A large number of the housewives who have attended the demonstrations may never have practiced what they heard preached in so far as this detail is concerned, but the impression was gotten over that our organization was interested in the most economical as well as most efficient service possible.

Good Will Advertising

Closely related to educational advertising is good will advertising. This class of advertising is designed to make and keep the customer and the public generally cognizant of the problems, difficulties and accomplishments of the gas company, and of the importance of a high standard of gas service to the community. In the preparation of all classes of gas advertising the writer should endeavor to give it such a slant as will win for his company the interest, friendship and sympathy of his customers and the public.

The Form of the Advertisement

All three classes of advertising which have been mentioned may be presented to the public in various forms. As has already been intimated, the newspaper is the most important advertising medium in almost every instance and under practically all conditions. When the co-operation of the news department of the newspapers can be secured, so much the better; but, whether or not this co-operation is secured, newspaper display space is still the most important medium through which advertising can be projected to the customer. People whose friendship has been won through good will or educational advertising in the newspapers do not come to you and tell you that such is the case—they may not even know it themselves—but the results are just as certain. The customer who buys a range does not say to you that he saw it advertised in the "News" or the "Times," or whatever may be the name of the paper, but your commercial manager will almost invariably note that as long as he continues to use advertising space customers continue to come, and at the moment he stops his advertising customers stop coming.

Direct by Mail Advertising

Direct by mail advertising is often most effective, particularly when it is co-ordinated with newspaper advertising. In our company we have gotten splendid results from it and we are going to use more of it hereafter. This form of advertising embraces not only circular letters, but attractively gotten up circulars. One of the most effective single pieces of direct by mail advertising I ever observed was the sending out of 100 special delivery letters that were delivered the morning of the last day of a two weeks' sale of automatic water heaters. Fifty per cent of the heaters sold during the entire campaign were sold on that last day.

The Originality of Advertising Copy

Nowhere does initiative and originality count for more than in the working out of advertising schemes and advertising copy. Some people have a genius for it and some can't acquire any considerable degree of proficiency in the art even through the most earnest and studious application. Originality, even to the degree of freakishness, is often profitable. For instance, Albert Forney's idea of a Black Cat Sale, with its culmination on Friday the 13th, has spread over the entire country. Forney's sale was frowned upon and he was discouraged by quite a number of superstitiously inclined members of our organization. Our blond gas manager persisted, however, and put over the most successful sale ever conducted on our system, or one of similar size.

The fact that Forney had an automobile collision the night his sale closed, smashing his car beyond repair, and putting him under a surgeon's care for several days, has nothing to do with the success of his sale. Neither does the fact that on the day following the conclusion of the sale we had a $20,000 fire in a power station adjoining the gas plant which knocked the entire street railway system of Charlotte out of commission for nineteen hours. Two or three other little things happened, but none of them had any relation at all to Forney's wonderfully successful sale of gas appliances.

Most Important to Win and Hold Public Confidence

After all, the most important thing in gas advertising is to win and hold the confidence and the friendship of our customers and the public. This

idea should be uppermost not only in the handling of good will advertising but also in the handling of educational and straight commercial advertising. And in all advertising, it is needless to say, no statement should be made that the entire gas organization is not willing to back to the limit.

Through judicious advertising, backed up by gas organizations which possess a real spirit of service, gas can and will be made to play an increasingly important part in our domestic and industrial life.

THE UNIT HOT AIR HEATER—ITS POSSIBILITIES AS A GAS FIRED SPACE HEATING APPLIANCE

(Continued from page 480)

Volume of Cold Air Passing Over Heat Absorbing Surface

The volume of air passing over the heating surface will depend on the area of the inlet openings and the velocity. We have found, in the unit air heater, that as we increased the area of the inlets, the efficiency decreased, while if we increased the velocity, up to a certain point, the efficiency increased. The reason for this is obvious. Warm air heating depends on the difference in weight between the air in the room to be heated and the heated air leaving the appliance. Further, inasmuch as the method of heat transfer in this case is essentially conduction, the greatest heat exchange occurs at the point of greatest temperature difference between air to be heated and the heating surface.

As we now increase the area of the inlet air openings the velocity of the air is reduced, and every instant during its travel the ratio of the heat transfer becomes less and less and our efficiency decreases. It is quite true that the air leaving the heater may be higher in temperature but as heat input it is measured by the product of the quantity of air heated, the temperature and the specific heat, it is evident that the volume decrease, due to low velocity, will be greater than the temperature increase, and hence the total heat input will be reduced.

If, however, the inlet openings are reduced, the velocity will increase and though the final temperature of the air leaving the heater is not so high, yet the heat transfer is more complete because of the continued difference in temperature between heating surface and the air in contact with it. If, with fixed air inlet openings, a fan be used to still further increase the velocity of the air through the heater, the efficiency will continue to rise. (See, for example, the so-named "Hot Blast Systems.") This, of course, cannot go on indefinitely. Due to the low specific heat or air, a certain time factor enters and if the velocity exceeds a certain point, there will be no time for effective heat transfer and the efficiency decreases.

Velocity and Temperature Limits

There should, of course, be a limit to the velocity and temperature at which air leaves a register face. The common practice is to have the air leaving the register 60 per cent F. above the room temperature, and in velocity high enough to cause two complete air changes per hour. This data, however, is for continuously operating central heating plants. For auxiliary heaters, where rapid increases in temperature are desired, it is permissible to have outlet air temperature from 80 to 100 deg. F. above the existing room temperature and a velocity ample to cause six to ten complete air changes per hour.

Test No.	B.t.u. Per Hr.	Cu. Ft. @ 550 B.t.u.	Efficiency	Cu. Ft. Air Per Hr.	B.t.u. Per Hr. in Air	Rise in Temp. in °F.	Velocity Feet per Min.	% Excess Air in Flue	Area of Air Inlet Sq. Ft.	Area of Air Outlet Sq. Ft.
1	34,900	65.8	39.85	8,580	13,900	107.5	275	67.2	3.28	.52
2	34,900	65.8	38.90	8,580	13,580	104	275	67.2	3.28	.52
3	34,450	65.1	47.20	11,580	16,280	90.5	185	67.2	3.28	1.04
4	34,220	64.6	49.20	9,400	16,830	120	301	36.5	3.28	.52
5	28,100	53.0	58.80	8,829	16,600	128	283	72.9	3.28	.52
6	16,550	31.2	77.33	7,930	12,800	106	254	73.0	3.28	.52
7	33,950	64.0	55.40	9,480	18,780	136	304	36.5	2.51	.52
8	33,590	63.3	55.70	9,280	18,710	140	298	36.5	1.68	.52
9	33,000	62.3	57.30	9,040	18,900	146	290	36.5	.838	.52
10	32,200	60.7	47.30	8,520	15,200	117	273	70.1	3.28	.52
11	31,200	58.9	64.60	9,580	20,150	148.5	307	46.1	3.28	.52
12	32,550	61.4	63.30	9,520	20,600	153	305	8.64	3.28	.52
13	32,600	61.4	70.90	11,450	23,170	140	367	8.64	3.28	.52
14	32,550	61.4	88.74	14,880	28,880	126	238	8.64	3.28	1.04
15	28,700	54.2	70.50	9,740	20,220	146	312	17.3	3.28	.52
16	18,900	35.7	78.83	8,920	14,900	111	286	38.4	3.28	.52
17	32,300	60.9	68.30	9,840	22,050	161	315	8.64	3.28	.52
18	32,300	60.9	70.20	9,840	22,680	168	315	8.64	3.28	.52
19	32,300	60.9	74.23	9,740	23,980	173	312	8.64	3.28	.52
20	32,700	61.6	63 90	9,310	20,900	160	299	20.2	3.28	.52

CORROSION AND DEPOSITS IN GAS DISTRIBUTING SYSTEMS

A Letter to the Editor Taking Exception to Commonly Held Views

Perhaps some of your readers can enlighten me as to why hydrogen sulphide and hydrocyanic acid are usually held responsible for corrosion and deposits in gas distribution systems.

The following figures and paragraphs were taken from an article in your journal for March 22:

	Sulphur	Blue	Sulphide Sulphate	Iron Oxides
1. Scale	?	4.28 p.c.	13.53 p.c.	68.41 p.c.
2. Deposit ...	4.13	.20 p.c.	17.26 p.c.	67.79 p.c.
3. Scale	.19	.17 p.c.	2.19 p.c.	83.90 p.c.
4. Mud	5.72	2.25 p.c.	12.14 p.c.	28.30 p.c.

Referring to the first analysis, we read: "Hydrogen sulphide would seem to be the primary cause of the trouble in this case, aided and abetted by oxygen and cyanogen compounds."

And, in conclusion, the statement is made that "Condensed water vapor adhered to parts of the interior of the crown at points of least slope near the center crown plate and acted as a local collector of hydrogen sulphide, which attacked the metal or metallic oxide. This iron sulphide oxidized and again sulphided, fulfilling the common purifying cycle. In the plate laps at the seam, the deposit accumulated; on the plate's interior surface, sulphide and oxide tended to dislodge and fall into the pit, thus exposing a fresh surface for further corrosive action. It will be noted that this holder crown merely acted as a gas purifier."

How Have These Conclusions Been Obtained?

The foregoing statements are not simply the expressions of the author's private opinion, but voice the conclusions of many who have written on the subject. How they arrived at these conclusions is what I would like to have explained.

We have made many analyses of deposits and, with few exceptions, have always found them to contain a greater proportion of iron oxides than of any other constituent. Some of these exceptions were deposits on the tin plate inside of dry meters, but these are explained by the fact that only very small areas of iron are exposed to the gas. These small areas evidently form rust so slowly that hydrogen sulphide and cyanogen have ample time to form sulphide and "blue" from the rust.

According to the theories advanced, sulphur and cyanogen should predominate, yet all the foregoing analyses show proportions of iron oxides which are greater than the sum of all the other constituents.

Corrosion Due to Water, CO_2 and Oxygen

The proportion of iron oxide in most deposits has led me to believe that corrosion is primarily due to water, carbon dioxide, and oxygen, acting together, even as in the case of iron exposed to the air. Sulphur and hydrocyanic acid may aid, but it is more probable that their main reaction is with iron oxide already formed.

The Gas World, April 26, 1924, has just published an abstract of a paper which gives the pre-eminence to hydrocyanic acid and hydrogen sulphide, but several articles in previous issues have repudiated this theory, notably the number for July 7, 1923. This issue contains a report on interesting experiments by H. E. Williams (a cyanogen specialist) which should have been republished in the U. S. A. His tests showed that hydrocyanic acid has very little, if any, corrosive action on iron.

As corrosion of mains, etc., is one of the subjects now before the technical section of the A. G. A., it would be well to start a discussion with the object of laying the blame at the right door. This would simplify the problem of how to reduce or prevent corrosion, by setting the investigator on the track of the real offenders instead of having him waste his time on suspects.

D. WILSON,
Chief Chemist Laclede Gas Light Co., St. Louis, Mo.

A GAS COMPANY IN SUNNY HAWAII

(Continued from page 476)

that we know you'll be satisfied and your gas bill will be so small as to surprise you. If you aren't getting the results you should, tell us, and we'll show you how.

THE GAS MAN.

The Cheapness of Gas as a Fuel

Statistics interest some, particularly the masculine members of the household.

IF GAS WERE A LUXURY YOU'D THINK IT CHEAP

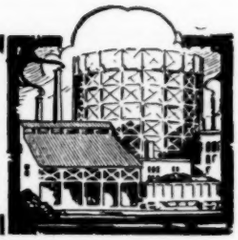
Do you ever feel like grouching, Mr. Average Householder, when you get your gas bill? Perhaps you don't, but some men do, no matter how small the bill may be. If you ever do feel that way, just compare the gas bill with the amount you spend in a month for smokes. Of course, if you are a member of the Anti-Tobacco League, this doesn't apply to you.

The latest figures collected by the Census of Manufactures show that in 1921 the value of manufactured gas sold was $411,195,503. In that year $806,748,865 was spent for cigars and cigarettes. "Smokes" cost nearly twice as much as gas. But mighty few men ever kick about their tobacco bill, even if they do have to pay ten cents for a five-cent cigar.

I don't want to start any family rows, but I will suggest to the Honolulu housewives that any time their husbands roar about the gas bill they ask how much the tobacco bill was for the previous month.

THE GAS MAN.

NEWS OF THE GAS INDUSTRY



Natural Gas Association Meets in Cleveland

H. A. Wallace Opens 19th Annual Meeting With Warning of Decreasing Supply

Cleveland, O.—Sounding a warning that the reserves of natural gas in the United States are bound to have a limit, H. A. Wallace, president of the Natural Gas Association of America, formally opened the 19th annual convention of the organization in Public Auditorium on Tuesday. Twelve hundred leaders of the natural gas industry were here to discuss problems.

"This is the third time that we have met in session in Cleveland," President Wallace, who is from Charleston, W. Va., said, in his opening address.

"It is peculiarly appropriate that we should be meeting here at a time of such importance for the future of our industry, for there is no city more vitally interested in that future than Cleveland, owing, as it does, much of its growth and prosperity to its good fortune in having been supplied from comparatively early days with the greatest of nature's fuels.

"In the era of transition upon which we are already entering, Cleveland, like all cities served by natural gas, must depend for the continuance of that prosperity originally due to nature's bounty, upon the wisdom and foresight with which problems ahead are met and overcome.

"We cannot hope to pass successfully through the period of transition without public support, and public support can only be gained and held by thorough education of our communities on the inevitable increase in the cost of service which changing conditions will entail."

Lack of public appreciation of the value of natural gas was responsible, he declared, for the great waste in the past. True conservation, he continued, lies not in merely hoarding the dwindling supply, but in its economical and efficient use in the manner best suited to secure to the greatest number, for the longest possible period, the fullest measure of benefit.

Suggests Mixed Gas

Frank L. Pringle, of the Lima Natural Gas Co., Lima, O., addressed the opening session of the Natural Gas Association convention on the subject of "From Natural Gas to Manufactured Gas."

He said in part:

"Natural gas has been produced in the United States for about 60 years. The gas consumed today cannot be replaced tomorrow.

"In order that communities now enjoying the privileges and conveniences of natural gas may in the future have an adequate gas service, two steps may be taken. The first is to turn to manufactured gas entirely. The second is to use available natural gas as an enriching agent in furnishing mixed gas. The latter is the most logical.

"Some years ago the idea of furnishing a mixed gas was but theory; today it is a practice. In a number of communities a mixture of natural and artificial gas has been supplied with success. Los Angeles is the largest city in the United States so supplied.

"The Lima Natural Gas Co., like all other natural gas companies, has experienced natural gas shortages. The supply of natural gas was not sufficient to meet the demands of its patrons. In order to meet this situation the company elected to supplement the available natural gas supply with the manufactured product. This has been done successfully for 14 months.

"In the 38 years our company has existed, five different natural gas fields, from which its source of supply came, have become exhausted. During the past winter, when we experienced the coldest weather that has been felt for some 12 years, and practically all cities in this state were having natural gas shortages, the patrons of our company were privileged to enjoy an uninterrupted and entirely satisfactory service, due to the facilities employed at our plant which enabled us to furnish a mixed product."

Better Appliances Eliminate Waste

Better natural gas service to all consumers can be brought about by the elimination of waste, E. J. Stephany, industrial gas engineer, Pittsburgh, told members in his talk on "Popular Conceptions and Misconceptions About the Natural Gas Business."

"A great many complaints of poor service originate from poor appliances or adjustments which waste gas," the speaker said. "A great many complaints of high gas bills are due to poor appliances or adjustments. It is good policy for the gas company to eliminate the causes of complaints as far as possible.

"With higher gas rates it is inevitable that the average customer will waste less gas. The elimination of waste will prolong the life of natural gas companies and it will extend the time during which natural gas with its many advantages can be enjoyed by many people."

H. B. Wells, member of the Public Service Commission of Massachusetts, read a paper on "Rate Structures with a Service Charge."

He strongly urged the adoption of a service charge for gas customers as a matter of fairness to both the consumer and company.

E. A. Emery, vice-president of Ford, Bacon & Davis, New York City, spoke on "Valuation for Rate Making."

Southwestern Public Service Association Meets in Twentieth Convention

The twentieth annual convention of the Southwestern Public Service Association and the fourth annual convention of the Southwestern Geographic Division, N. E. L. A., held for the first time in the history of either association at New Orleans April 22-25, drew the largest attendance ever registered at a convention of either association, with a registration of about 600. Enthusiasm prevailed and southern hospitality and entertainment were abundantly manifest.

Secretary-Manager Forward Addresses Meeting

Alexander Forward, secretary-manager, American Gas Association, taking for his theme, "A Giant Awakened," outlined the rapid progress of the use of gas in spite of the prophecies made time after time that the gas industry was about to decline. He predicted practically unlimited future for this fuel, which, in time, should supplant very largely the use of raw coal, petroleum and other fuels in the production of heat for practically all purposes. He, too, stressed the necessity of fully acquainting the public with the facilities offered by the gas utilities and problems arising from the necessity for rendering service.

"Building True Conception of Utilities in the Public Mind," by E. F. Wickwire, vice-president Ohio Brass Company, Mansfield, Ohio, was one of the outstanding addresses on public relations. Rendering good service, the speaker pointed out, while it is the basic essential of good relations, cannot create good will without publicity, and publicity unsupported by service is less effective. The company must sell itself as well as its service to the public. Good public relations, the speaker pointed out, require knowing the public, knowing the utility employees and knowing the press. Furthermore, this activity requires executives just as high-priced as does the operating department—preferably a vice-president in charge of sales and public relations who will work in close co-operation with the vice-president in charge of operation.

Gas Section

Three most enthusiastic and well attended meetings of the gas utility men were held, including one entire session devoted to the discussion of the results of research in welding cast iron pipe joints, together with a practical demonstration staged at the shops of the New Orleans Public Service, Inc., by H. Y. Carsons, research engineer of the American Cast Iron Pipe Company, in collaboration with the Linde Air Products Company and the gas department of the New Orleans Public Service. There was also discussion and papers on testing gas appliances for approval, by C. B. McKinney, Municipal Gas Company, Dallas; W. B. Way, Natural Gas Association of America; Alexander oFrward, secretary - manager, American Gas Association, and others; "Maintenance and Repairs of Domestic Meters," by T. P. Walker, Baton Rouge Electric Co.; "How to Increase Industrial Gas Sales," F. H. Cauley, Peoples Gas Light & Coke Co., Chicago; "How Can the Manufacturer Assist the Gas Company," F. A. Lemke, the Humphrey Co.; "Uniform Classification of Accounts," J. M. Roberts, Peoples Gas, Light & Coke Co., Chicago; "Rate Structure for Selling Gas," F. J. Schwab, New Orleans Public Service, Inc.; "Meter Deposits, Collections and Cut-Offs," C. K. Fletcher, Ft. Worth Gas Co.

Entertainment

Supplementing the convention, which was most successful in its general aspects in the point of the program presented, in the point of attendance, the entertainment provided was most pleasing and attractive. The New Orleans members of the Suppliers' Section outdid themselves in providing the opening ball; the entertainment committee arranged a dinner dance in place of the annual banquet; a trip to the Spanish fort, with an old creole dinner, incidental entertainment and dancing, occupied the third evening; and, following the adjournment of the convention Friday afternoon, a harbor trip on the SS. "Capitol," to see the water front and points of interest about New Orleans.

The officers elected were: President, G. W. Fry, West Texas Utilities Co., Abilene; first vice-president and chairman light and power section, A. F. Townsend, Eastern Texas Electric Co., Beaumont; second vice-president and chairman railway section, W. E. Wood, Houston; third vice-president and chairman gas section, F. C. Armbruster, Southwestern Gas & Electric Co., Shreveport; treasurer, F. J. Gannon, Northern Texas Traction Co., Ft. Worth; secretary, E. N. Willis, 403 Slaughter building, Dallas.

Iowa District Gas Association Meets in Sioux City

Conventions come and conventions go, but the 1924 meeting of the Iowa District Gas Association, held at Sioux City, Iowa, April 16, 17 and 18, will live long in the memory of those who attended.

For 39 years Sioux City has been the home of L. L. Kellogg, one of the founders and the first president of the I. D. G. A. Mr. Kellogg has just completed 50 years of continuous service in the gas industry and the social features of the convention were built around this fact.

The annual banquet was held in the ballroom of the Hotel Martin, convention headquarters, on Thursday evening, with about 250 in attendance. W. J. Bertke, general manager of the Sioux City Gas & Electric Co., acted as toastmaster, and after a very enjoyable musical program he called upon Dr. Walton Clark, of the United Gas Improvement Co. of Philadelphia, to make the principal address. Dr. Clark has also completed more than 50 years in the gas industry and his address described the development of the industry during the last half century, together with Mr. Kellogg's connection with it. Dr. Clark has been associated with Mr. Kellogg during the greater part of this period and was in a position to tell many interesting experiences and episodes in Mr. Kellogg's career. The Iowa District Gas Association felt extremely honored in having Dr. Clark make the long trip from Philadelphia to Sioux City to help celebrate his friend Kellogg's fiftieth anniversary in the gas business.

Congratulatory letters and tele-

grams were read from many of Mr. Kellogg's friends, including Samuel T. Bodine, president of the United Gas Improvement Co.; W. F. Douthirt, of the American Light & Traction Co., New York; Col. Geo. D. Roper, of the Roper Corporation, Rockford, Ill., and H. B. Maynard, of the Citizen's Gas & Electric Co., Waterloo, Iowa. The latter two gentlemen were prevented by illness from attending the banquet.

Col. E. G. Pratt, an old friend of Mr. Kellogg's, and associated with him some years ago, with a very appropriate speech, presented Mr. and Mrs. Kellogg with a silver coffee service as an expression of the appreciation of the Iowa District Gas Association for the long term of faithful continuous service with the gas industry and this association by Mr. Kellogg.

The first session of the convention was opened by President Charles Smith, who called upon Mr. H. R. Stephenson to introduce Mr. Milton Perry Smith, commissioner of parks at Sioux City, who represented Mayor Gilman, and who made the address of welcome. This was responded to by President Smith, after which the business of the convention was disposed of.

This included reports by the secretary-treasurer and the finance committee, the various affiliation representatives on the managing committee of the American Gas Association, and the nominating committee. The following officers, members of council and affiliation representatives were nominated and elected:

Officers—President, H. J. Carson, Cedar Rapids, Iowa; first vice-president, C. M. Benedict, Des Moines, Iowa; second vice-president, Frank S. Edge, Grinnell, Iowa; secretary-treasurer, H. R. Sterrett, Des Moines, Iowa.

Council—H. V. Armstrong, Sioux Falls, S. D.; C. A. Nash, Davenport, Iowa; H. R. Stephenson, Sioux City, Iowa; B. W. Cowperthwaite, Faribault, Minn.; H. L. Green, Waterloo, Iowa; E. L. Vierigg, Grand Island, Nebraska.

Affiliation Representatives — Technical section, C. J. Hauschildt, Davenport, Iowa; accounting section, R. B. Searing, Sioux City, Iowa; commercial section, E. H. Martin, Des Moines, Iowa; manufacturers' section, Geo. D. Roper, Rockford, Ill.; advertising section, J. E. Shuff, Lincoln, Nebraska.

This was followed by the election of six new members.

Thursday Session

The Thursday morning session was opened by a very interesting paper on "Coke" by Mr. Walter M. Warren, secretary of the M. W. Warren Coke Co., St. Louis. His paper brought out some very interesting discussions, in which Mr. Warren explained the difference between by-product coke and gashouse coke, and also touched on the question of the disadvantage of using a mixture of these two types of coke.

Mr. R. C. Beebe, manager of the Southern Minnesota Gas & Electric Co., Rochester, Minnesota, followed with a paper on "The Installation of Hotel Gas Ranges in Rochester," which proved very interesting and indicated how a smaller situation had been successful in obtaining a large number of hotel installations. The discussion brought up the question of electrical competition in institutional cooking. The opinions expressed seemed to indicate that electricity, excepting possibly a few appliances, could not economically compete with gas, but that steps should be taken to improve the efficiency of utilization of gas appliances.

The Back Run Process

Mr. H. A. Kleinman, engineer, People's Power Company, Moline, Ill., discussed the "Back Run Process" as used at Moline. He presented some very interesting facts based on his own experience, which indicated that a substantial saving in fuel costs had been made with the back run process when operating with 100 per cent coke as generator fuel, but that with a mixture of coal and coke, the back run process had, as yet, not shown a marked economy.

We were glad to welcome Mr. N. T. Sellman, assistant secretary-manager of the American Gas Association, who read a paper on "Specifications and Appliance Testing." This explained the present status of the question of establishing a general laboratory for the testing of gas appliances and brought out very interesting facts regarding the necessity of testing all gas appliances and encouraging the sale of only those which are safe and efficient.

"Public Relations and Customer Ownership" was the title of Mr. L. O. Gordon's paper, which proved extremely interesting and indicated that Mr. Gordon has given deep thought and consideration to this subject.

The meeting was continued on Friday, April 18, 1924. Several interesting papers were read on that day.

Gsa Engineering Chair at Hopkins

Preparations are already under way for the establishment of a gas engineering chair at Johns Hopkins University, Baltimore, Md. This movement was fostered by the Southern Gas Association, and at the last meeting pledges were received in sufficient amount to carry the course over for five years.

L. Irving Pollitt, president of the Southern Gas & Elec. Corp., Baltimore, expects to leave for abroad within the next few weeks and will visit the engineering department of the University of Leeds and the University of Manchester, in order to get first-hand information which will be of value in the establishment of the gas engineering course at Hopkins.

Mr. Pollitt, while abroad, will also attend the gas and fuel sections of the World Power exhibition to be held in London in connection with the British Empire Exhibition. He will also attend the publicity and advertising section at the convention of the Associated Advertising Clubs of the World, which begins its session in London on July 14.

A New House Heating Rate for Tacoma, Wash.

Chicago, Ill.—What is expected to result in increased business for the company—the Tacoma Gas & Fuel Company division of the Mountain States Power Company, a Byllesby subsidiary, is the announcement that a new house-heating rate for Tacoma and Olympia, Wash., will be put into effect. A new 5,000,000 cubic foot capacity gas plant is being constructed in Tacoma and to keep this plant busy and also to induce customers to use more gas is the idea of the rate reduction. The new rate does not supplant the prevailing rate, but is optional with the customer. It is what is known as three-part annual rate, whereby the customer is charged 50 cents per meter per month, a demand charge of 3 cents a cubic foot per month, and a commodity charge of 55 cents a thousand cubic feet of gas used. The minimum demand is 100 cubic feet per hour. Regarding this new rate, the company says:

"The first part of the rate, the customer charge, covers the cost of management, handling and reading meters, bookkeeping, billing and other office expenses, cost of business development, advertising, etc. It depends largely upon the number of customers served and is about the same for each customer regardless of the amount of service he uses. The smallest customer requires as much attention as the largest; his meter has to be read, bills rendered, and so on. This part of the expense can be fairly prorated and averaged and this is what has been done in the flat customer charge of 50 cents a month. * * * The total demand is merely the sum of the individual demands of customers, but these individual demands differ a great deal. The customer who requires 240 cubic feet of gas for only one hour a day has a much greater effect upon the size of the plant investment than the customer who takes 10 cubic feet steadily throughout the day; yet the quantity of gas used in each case is the same.

"Therefore, the demand charges by covering the expense caused by the size of the investment enables the allocation of costs equitably among all the customers, and distributes these costs according to the benefits each receives.

"The commodity charge per thousand feet of gas is based entirely on the cost of manufacture, and is determined by the amount spent for superintendence, labor and materials."

Gas Course at Columbia

The Department of Chemical Engineering of Columbia University announces that the course on Production and Distribution of Manufactured Gas will again be given during the summer session, July 7 to August 15, 1924.

The course is designed to meet the needs of three classes of students.

1. Those who have had college training and some experience in the gas business and desire further information about the scientific principles underlying the practice of gas engineering.

2. Recent graduates of technical schools who are looking forward to employment in the gas industry.

3. Teachers of applied chemistry who desire more information about an industry which is of fundamental importance in practically all branches of industry.

The course is in charge of Prof. Jerome J. Morgan, who has had practical experience in the gas industry, and includes both lectures and laboratory work. In the lectures the main object is not to give detailed information about gas works practice, but rather to point out where such information can be obtained and to discuss fully from the chemical engineering standpoint the whys and wherefores of the various steps in modern practice. The discussion includes raw materials for gas making; carbonization at high and low temperatures; oil and blue gas processes; complete gasification; purification of gas; utilization of by-products; distribution and utilization of the finished product.

Plant Trips

To aid the members of the class in getting first hand information on present practice, five plant inspection trips and several special illustrated lectures are arranged. The special lectures are by men who are prominent in the gas industry and cover such subjects as: vertical retorts, coke ovens, water gas set construction, cracking of hydrocarbon oils, ammonia recovery, laboratory control, distribution and utilization problems, industrial heating, evaluation and gas rates.

In the laboratory the chemical examination of gas house materials and products is studied. The aim of the laboratory work is to give a thorough understanding of the principles of analysis rather than to develop skill in the actual testing. Attention is also given to the "trouble-shooting" function of the chemical engineer in the gas industry.

A large scale laboratory coal distillation plant is available for experimental work.

For further information address Prof. J. J. Morgan, department of chemical engineering, Columbia University, New York City.

New Contracts Awarded

The U. G. I. Contracting Company of Philadelphia has lately received contract from the Philadelphia Suburban Gas & Electric Company for the installation of carburetted water gas apparatus at its Chester, Pa., plant. This apparatus will be of the latest U. G. I. cone top type and will be equipped with automatic control.

This will add nearly 3,000,000 cu. ft. to the manufacturing capacity of the plant.

The Stacey Manufacturing Co. of Cincinnati, Ohio, has just received contract from the Byllesby Engineering and Management Corporation for the erection of a 100,000 cu. ft. capacity two lift gas holder at Eureka, California. All materials entering into the structure are to be of copper bearing steel.

At the present time the Stacey Manufacturing Co. is erecting five large oil storage tanks for a Cincinnati concern.

Third Year of Industrial Gas Class in M. I. T.

In a little over a month from now the industrial gas class will have started upon its work at the Massachusetts Institute of Technology. This will be its third year and we think the course can safely be considered no longer an experiment, but an absolute necessity for the industry.

Many changes have been made in the laboratory at the institute and the course has been broadened and enlarged considerably so that those who attend this year will come out with even better preparation on the subject of industrial gas than those during previous years. Professor Gordon B. Wilkes will have charge this year as formerly and will be ably assisted once again by Messrs. O. K. Bates and George Thomson. This assures the students of high grade instruction.

Program of the Class

Monday, June 16, 9 to 9:15 a. m. —Juniors: Opening, Francis E. Drake, chairman gas educational committee, manager gas department, Lynn G. & E. Co. Seniors: With juniors. 9:15 to 10:45 a. m. —Juniors: Water Gas Manufacture, H. Vittinghoff, eng., Stone & Webster. Seniors: Methods of testing appliances. 11 a. m. to 12:30 p.m.—Juniors: Coal Gas Manufacture, R. L. Fletcher, engineer of manufacture, Providence Gas Co. 1:30 to 4:30 p. m.—Juniors: Trip to gas works, courtesy A. C. Barnes, president Cambridge Gas Light Co. Seniors: Laboratory experiments in measurements of temperature.

Tuesday, June 17, 9 a. m.—Juniors: Heat, Temperature, Thermal Expansion. Seniors: Gas laboratory, practical operation, testing of all appliances by groups. 1:30 to 4:30 p. m.—Juniors: At 17 Roxbury street, Boston Cons. Gas Co. lecture room; Practical Burner Adjustments to Insure Correct Combustion, P. J. LaFore, engineed of industrial sales. Seniors: Gas laboratory.

Wednesday, June 18, 9 a. m.—Juniors, Melting and Boiling; Specific Heat; Transfer of Heat, Radiation, Convection, Conduction. Seniors, Gas laboratory; all senior periods in laboratory except during joint lectures. 1:30 to 4:30 p. m.—Juniors: Actual Use in Laboratory of Thermo-couples, Optical Pyrometers, etc.

Thursday, June 19, 9 a. m.—Juniors: Refractories, Combustion. Seniors: Appliances to be operated and tested: Boilers, Bryant, Kane, Ofeldt, Roper; ovens, Gehnrich, Improved, Blodgett; furnaces, American Gas, American Carbonizing, Surface Combustion, Gilbert & Barker, Improved Soft Metal, Maxon Brass, Recuperative Brass, Cauldron; water heaters, Instantaneous Storage, Immersion, Selas System.

Friday, June 20, 9 a. m.—Juniors: Heat Calculations; Cost of Different Fuels; Efficiency Calculations. 1:30 to 4:30 p. m.—Calorimeters, gas, bomb.

SECOND WEEK

Monday, June 23, 9 a. m.—Juniors: Combustion and Utilization, Henry O. Loebell, vice-president and general manager Combustion Utilities Corp. Seniors: Joint session with junior students. 1:30 to 4:30 p. m.—At 17 Roxbury street, Boston Con. Gas Co. industrial laboratory, actual treatments and demonstration of various furnaces. Seniors: Gas laboratory.

Tuesday, June 24, 9 a. m.—Juniors: Gas laboratory. Seniors: Heat Treatment, laboratory, Victor O. Homerberg, Mass. Inst. of Tech. 1:30 to 3:15 p. m.—Heat Treatment, Prof. R. S. Williams, Mass. Inst. of Tech. Seniors: Joint session with junior students. 3:30 to 4:30 p. m.—Juniors: Heat Treatment, laboratory. Seniors: Gas laboratory.

Wednesday, June 25, 9 a. m.—Juniors: Low Temperature Ovens, M. B. Webber. Seniors: Gas laboratory or attendance at joint session with junior students (optional). 1:30 to 4:30 p. m.—Juniors: Heat Treatment, laboratory. Seniors: Gas laboratory.

Thursday, June 26, 9 a. m.—Volume Water Heating, N. T. Sellman, engineer, assistant secretary-manager American Gas Association. Seniors: Joint session with junior students. 1:30 to 4:30 p. m.—Juniors: Conducted visitation to working installations of: Ovens, Brass Melting, Heat Treating, Water Heating. Seniors: Gas laboratory.

Friday, June 27, 9 a. m.—Juniors: Fuels used in industrial processes, E. G. DeCoriolas, engineer, Eastern Service Co.; general discussion of specific problems; questions and review at close of second forenoon period. Seniors: Joint session with junior students for entire day.

12:30 p. m.—Riverbank Court Hotel, luncheon and annual meeting of industrial organization; address by Col. Charles R. Gow, president Charles R. Gow Co.

Guy M. Johnson New President of Indiana Gas Association

West Baden, Ind.—G. M. Johnson, manager of the South Bend district of the Northern Indiana Gas and Electric Company, was elected president of the Indiana Gas Association.

Mr. Johnson, who has been active in the manufactured gas industry for the last eighteen years, has been manager at South Bend since September 12, 1918. He has direction of the company's gas properties and business in South Bend, Mishawaka and Plymouth. On March 1, Mr. Johnson was elected vice-president of the Elkhart Gas and Fuel Company also.

Mr. Johnson is a native of Wisconsin, being born in West Salem in that state, July 15, 1884. He was graduated from the University of Wisconsin in June, 1906, and was immediately employed by the Kansas City Gas Company, where he worked until May 1, 1909, when he went to Omaha as superintendent of distribution for the Omaha Gas Company.

On April 1, 1911, he went to the Philadelphia office of the United Gas Improvement Company and spent the next two years on various construction jobs throughout the country. He re-entered the employ of the Omaha Gas Company as superintendent of manufacturing on December 1, 1913, and continued there until September 12, 1918, when he became manager of the South Bend district of the Northern Indiana Gas and Electric Company. Since managing the South Bend district the output of gas has increased from 1,900,000 cubic feet daily to 3,800,000 cubic feet.